Computer Technology

K-12

Computer Technology: Literacy and Usage K-12

Computer Technology: Programming 9-12

Computer Technology: Research and Development 9-12

Committee

Acknowledgments

The Computer Technology Standards are develop with tremendous research and input from Business and Industry, a network of State and Local Supervisors from across the country, the National Standards for Business Education, the National Education Technology Standards, The *Ed Tech* Initiative, *No Child Left Behind Act*, Department of Education staff, and a year long discussion with business and industry personnel, teachers, teacher educators, counselors, and vocational directors. Although the list is endless, we would like to formally thank the different committees involved in the development of the Computer Technology Standards. A strong commitment was made by the committees below to develop a K-12 scope and sequence that resulted in a rigorous set of computer technology, technology, and business technology standards for students bringing together both Career and Technology Education and Curriculum and Instruction through extensive collaboration between Computer Science staff, Business Technology staff, and other Career and Technology Education staff and all committees. The Computer Technology standards form the basis for many other technology courses both academic and vocational.

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Section 1 – Literacy and Usage

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Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Rationale

Students in the 21st Century must be prepared for technological advancements in life. A computer skills curriculum prepares students in the use of computers to access and apply data necessary to solve problems in a technology-based society.

Our rationale for incorporating computer literacy into the Tennessee curriculum is to extend this use within the K-12 framework of subjects. Achieving proficiency with the computer, like learning in any other discipline, is based upon a continuum of knowledge and skill development. The computer proficiency continuum begins with an awareness of what a computer is, passes through a level of literacy, and culminates in mastery in which advanced applications and sophisticated programming techniques are understood and practiced.

At the awareness level the learner is introduced to the computer and its many functions. Concepts dealing with what a computer is, how its "brain" works, and how it affects our daily lives, are explored. The learner also becomes acquainted with the specialized terminology of computers and computing.

At the literacy level the student gains a working knowledge of computer functions by learning how to perform simple programming operations and how to use application software. Inferences can be made about the impact of computers on the individual and on society and when the use of computer applications is appropriate. At this level, career opportunities explored and various positions in computer operations are identified.

At the mastery level the student learns the complexities of computer operations. Advanced knowledge of at least one programming language is acquired. The multi-faceted sociological impact of computers (both positive and negative) is also understood.

The Computer Technology: Literacy and Usage K-12 standards is intended to allow the local system to develop curriculum that will lead the novice learner from the awareness level through the literacy level. Yet, it is planned in a manner that will allow the more advanced student to benefit from its content as well. School systems may choose to integrate the Computer Technology: Literary and Usage K-12 standards into other subject areas. The 9-12 section may be taken as part of a course sequence. This section is adapted from National Education Technology Standards (NETS*) for Students.

A technologically literate student:

- exhibits ethical and responsible behavior when using technology:
- acquires knowledge in the use of technological resources, processes, and applications (software);

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- accesses, organizes, analyzes, synthesizes, and presents information;
- enhances the effectiveness of a broad range of communication skills;
- develops problem solving strategies to accomplish tasks while expressing individual creativity;
- and becomes aware of career opportunities relating to computer technology.

The Computer Technology 9-12 program standards, (research and development?) are intended to allow the local system to develop curriculum that concentrates on the mastery of at least one computer language and/or sophisticated interactive programming and authoring.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Computer Technology: Literacy and Usage

KINDERGARTEN

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1. Students will demonstrate an understanding of the nature and operation of technology systems.

1.2. Students will exhibit a proficiency in the use of technology.

1.3. Students will develop basic skills (alpha numeric and symbol characters) in using keyboard using the touch system.

Accomplishments

K.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
- a. Identify the computer as a machine that helps people work and play.
- b. Identify and use input devices such as a disk drive, mouse, keyboard,CD-Rom, etc.
- c. Identify and use output devices such as a disk drive, monitor, printer, CD-Drive, etc.
- d. List the rules for the proper care of computer equipment
- e. Demonstrate proper care for computer and other technologies properly.
- f. Use and apply appropriate computer and keyboarding terminology.

K.1.2. Students will exhibit a proficiency in the use of technology.
- a. Demonstrate proper sequence for turning on and turning off computers and other technologies.
- b. Operate a mouse (click, double-click, click and drag, click and hold/draw.
- c. Open/Launch a program/application from an icon
- d. Quit a program/application.
- e. Follow directions in a menu-driven program.
- f. Minimize and maximize windows.
- g. Operate stroll bars.
- h. Print, save and reopen documents/files with teach guidance.

K.1.3. Students will develops basic skills (alpha,numeric, and symbol characters) in using keyboard using the touch system.
- a. Use the correct hand and body position while applying the proper touch method of keying for the home row keys (A, S, D, F, J,K, L, ;).

b. Use appropriate hand pressure on mouse and keyboard.
c. Operate special purpose keys (return/enter, spacebar, esc, arrows, shift, backspace).
d. Know the relative position of the alpha/numeric keys.
e. Color a drawing of the keyboard indicating which finger should operate which keys.

Performance Indicators
By the end of the second grade the student will be able to

- Identify the home row keys (A, S, D, F, J, K, L, ;).
- Have an awareness of the layout of the computer keyboard
-
- use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies.
- use keyboarding skills to produce grade appropriate projects.
- use a variety of media and technology resources for directed and independent learning activities.
- communicate about technology using developmentally appropriate and accurate terminology.
- use developmentally appropriate multimedia resources (e.g., interactive books, educational software, multimedia encyclopedias) to support learning.

Sample Performance Tasks

a. Using pictures of the various parts of a computer (e.g. disk drive, CPU, monitor, keyboard, mouse, etc.) and word cards, students match the words with the pictures and tell what each part does. Using a checklist to evaluate this task, proficiency would include student application of this knowledge to components of a real computer.
b. Using a checklist, students will demonstrate how to turn on the computer, open a designated program, exit that program, and shut down the computer with teacher supervision. Proficiency of this task is met when all items on the list are completed.
c. Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations
2.1. Students will understand the ethical, cultural, and societal issues related to technology.

2.2. Students will practice responsible use of technology systems, information literacy, and software.

2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments
K.2.1. Students will understand the ethical, cultural, and societal issues related to technology.
   a. Demonstrate the safe use of electronic technologies.
   b. Describe how computers are used in our daily living (home and work).
   c. Respect the privacy of others.

K.2.2. Students will practice responsible use of technology systems, information literacy, and software.
   a. Understand and follow classroom rules for technology use.
   b. Recognize the importance of supervised use of technology.
   c. Notify the teacher immediately if an inappropriate website appears when using the internet.

K.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
   a. Respect the rights of others.
   b. Recognize that technology can be used to assist learning.

a.

Performance Indicators
By the end of the second grade the student will be able to:
- work cooperatively and collaboratively with peers, family members, and others when using technology.
- demonstrate positive social and ethical behaviors when using technology.
- practice responsible use of technology systems and software.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Sample Performance Task

a. Using pictures from magazines, newspapers, and/or drawings, students will make posters of the different ways computers are used in their lives. The students will then display and explain their choices of pictures.
b. Student will participate in a classroom discussion of responsible use of technology systems and information literacy.

Standard 3.0

Students will use technology productivity tools.

Learning Expectations

3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.

Accomplishments

K.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.
   a. Use the computer and technology resources to practice learning skills such as computer puzzles, matching games, logical thinking programs, etc.
   b. Follow directions in a menu-driven program.
   c. Identify and explain the function of the icons used in the various programs.
   d. Create text using the computer

K.3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.
   a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
   b. Use text, paint, and/or drawing tools to create simple documents.
   c. Recognize that different software programs are design for specific purposes.

Performance Indicators:

By the end of the second grade the student will be able to:

- Use a variety of media and technology resources for directed and independent learning activities.
- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

a. *Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.*
b. Following teacher instruction on entering data and making a chart, students will make a graph. This activity will be evaluated through a teacher observation checklist with proficiency shown by the printed graph.

Standard 4.0
Students will use technology communications tools.

Learning Expectations

4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

K.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
a. Recognize and discuss telecommunications as a way to share information electronically.
b. Discuss ways multimedia software is used to communicate information and ideas.

K.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
a. Recognize and discuss telecommunications as a way to share information electronically.
b. Use multimedia software to communicate information and ideas.
c. Identify various technology communication tools such as radio, television, telephone, internet, e-mail, fax, etc.
d. Operate a telephone/cell phone and basic video and audio equipment.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Performance Indicators
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.
- gather information and communicate with others using telecommunications with support from teachers, family members, or student partners.

Sample Performance Task

- Using multimedia software, students communicate ideas through text and graphics by creating letters or class presentations. Proficiency will be determined using a rubric.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.

5.2 Students will use technology tools to process data and report results.

5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

NOTE: At this level the teach will direct the activities. Students use of the internet and other research sources will be determined by the teacher. Students should be aware that technology can be used for gathering information.

K.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Use the internet to go to a teacher selected sites.
   b. Print/copy information from those sites.

K.5.2. Students will use technology tools to process data and report results.
   a. Discuss what they found at the sites.
   b. Talk about the information as to its helpfulness for the assigned task.
   c. Recognize that information needs to be organized.

Performance Indicators

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

- Given a question or a topic related to any content area, the student will use developmentally appropriate technology to respond to the question or collect information on the topic. Proficiency will be determined using a rubric developed by the teacher.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

K.6.1. Students will use technology resources for solving problems and making informed decisions.
   a. Recognize that computers were created to assist in solving problems. (Computer History)
   b. Use a step-by-step process for solving a problem.
      1. Order specific steps in the solution of a problem.
      2. Choose the proper steps in the solution of a problem.
      3. Choose and order the steps in the solution of a problem

K.6.2. Students will employ technology in the development of strategies for solving problems in the real world.
   a. Use the computer and technology resources as a learning tool.
   b. Use multimedia software to express ideas and solve problems.
   c. Use some method of storyboarding to create a presentation.

Performance Indicators:
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

- Students will use the internet with teacher's assistance to examine selected websites to acquire information and illustrate thoughts, ideas, or stories with multimedia software.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

FIRST GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations:

1.1 Students will demonstrate an understanding of the nature and operation of technology systems.

1.2 Students will exhibit a proficiency in the use of technology.

1.3 Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system

Accomplishments

1.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
- a. Identify the computer as a machine that helps people work and play.
- b. Identify and use input devices such as a disk drive, mouse, keyboard, CD-Drive, etc.
- c. Identify and use output devices such as a disk drive, monitor, printer, CD-Drive, etc.
- d. List the rules for the proper care of computer equipment
- e. Demonstrate proper care for computer and other technologies properly.
- f. Use and apply appropriate computer and keyboarding terminology.
- g. Explore basic navigation of the operating system as it relates to applications used on the computer.
- h. Differentiate between the operating system and an application/program.

1.1.2. Students will exhibit a proficiency in the use of technology.
- a. Demonstrate proper sequence for turning on and turning off computers and other technologies.
- b. Operate a mouse (click, double-click, click and drag, click and hold/draw.
- c. Open/Launch a program/application from an icon
- d. Quit a program/application.
- e. Follow directions in a menu-driven program.
- f. Minimize and maximize windows.
- g. Operate stroll bars.

h. Print, save and reopen documents/files with teach guidance.

1.1.3. Students will develop basic skills (alpha/numeric and symbol characters) in using keyboard using the touch system.
a. Use the correct hand and body position while applying the proper touch method of keying for the home row keys (A, S, D, F, J,K, L, ;).
b. Use appropriate hand pressure on mouse and keyboard.
c. Operate special purpose keys (return/enter, spacebar, esc, arrows, shift, backspace).
d. Know the relative position of the alpha/numeric keys.
e. Color a drawing of the keyboard indicating which finger should operate which keys.
f. Key words consisting of the home row key letters using the proper touch keying technique.
g. Extend keying skills to the row above and below the home row keys using the proper fingering (Q,W,E,R,T,Y,U,I,O,P,[,], \ Row above; Z,X,C,V,B,N,M,",", ".", / Row below).

Performance Indicators
By the end of the second grade the student will be able to

- Identify the home row keys (A, S, D, F, J, K, L, ;), and the keys above and below the home row keys..
- Have an awareness of the layout of the computer keyboard
- use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies.
- use keyboarding skills to produce grade appropriate projects.
- use a variety of media and technology resources for directed and independent learning activities.
- communicate about technology using developmentally appropriate and accurate terminology.
- use developmentally appropriate multimedia resources (e.g., interactive books, educational software, multimedia encyclopedias) to support learning.

Sample Performance Tasks
a. Using pictures of the various parts of a computer (e.g. disk drive, CPU, monitor, keyboard, mouse, etc.) and word cards, students match the words with the pictures and tell what each part does. Using a checklist to evaluate this task, proficiency would include student application of this knowledge to components of a real computer.

b. Using a checklist, students will demonstrate how to turn on the computer, open a designated program, exit that program, and shut down the computer with teacher supervision. Proficiency of this task is met when all items on the list are completed.
c. Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.

2.2 Students will practice responsible use of technology systems, information literacy, and software.

2.4. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

ACCOMPLISHMENTS

1.2.1. Students will understand the ethical, cultural, and societal issues related to technology.
   a. Demonstrate the safe use of electronic technologies.
   b. Describe how computers are used in our daily living (home and work).
   c. Respect the privacy of others.

1.2.2. Students will practice responsible use of technology systems, information literacy, and software.
   a. Understand and follow classroom rules for technology use.
   b. Discuss the Acceptable Use Policy.
   c. Recognize the importance of supervised use of technology.
   d. Notify the teacher immediately if an inappropriate website appears when using the internet.
   e. Know how “pop-up” windows happen and not to respond.

1.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
   a. Respect the rights of others.
   b. Recognize that technology can be used to assist learning.
   c. Discuss ownership of computer-created work.

Performance Indicators
By the end of the second grade the student will be able to:
- work cooperatively and collaboratively with peers, family members, and others when using technology.
- demonstrate positive social and ethical behaviors when using technology.
- practice responsible use of technology systems and software.

Sample Performance Task
a. Using pictures from magazines, newspapers, and/or drawings, students will make posters of the different ways computers are used in their lives. The students will then display and explain their choices of pictures.
b. Student will participate in a classroom discussion of responsible use of technology systems and information literacy.

Standard 3.0
Students will use technology productivity tools.

Learning Expectations
3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.
3.2 Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.

Accomplishments
1.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.
   a. Use the computer and technology resources to practice learning skills such as computer puzzles, matching games, logical thinking programs, etc.
   b. Follow directions in a menu-driven program.
   c. Identify and explain the function of the icons used in the various programs.

d. Create text and graphics using the computer

1.3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.
   a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
   b. Use text, paint, and/or drawing tools to create simple documents.
   c. Recognize that different software programs are design for specific purposes.
   d. Recognize the characteristics of multimedia (text, audio, images, video, etc.).
   e. Identify and discuss multimedia terms/concepts (slide/card, link/button, text box, navigate, transition) as a class/group.

Performance Indicators:
By the end of the second grade the student will be able to:

- Use a variety of media and technology resources for directed and independent learning activities.
- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.
- Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

a. *Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.*
b. Following teacher instruction on entering data and making a chart, students will make a graph. This activity will be evaluated through a teacher observation checklist with proficiency shown by the printed graph.

Standard 4.0

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Students will use technology communications tools.

Learning Expectations

4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

1.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   a. Recognize and discuss telecommunications as a way to share information electronically.
   b. Use multimedia software to communicate information and ideas.
   c. Use the computer as a writing tool.

1.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
   a. Experiment with basic formatting options in a word processor to produce a publication for each of the following: a student, a teacher, a friend, and a parent.
   b. Suggest ways telecommunications can be used to share information electronically.
   c. Explore the use of multimedia software to enhance the communication of information and ideas.

1.4.3. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
   a. Recognize and discuss telecommunications as a way to share information electronically.
   b. Use multimedia software to communicate information and ideas.
   c. Identify various technology communication tools such as radio, television, telephone, internet, e-mail, fax, etc.
   d. Operate a telephone/cell phone and basic video and audio equipment.

Performance Indicators

By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.
- gather information and communicate with others using telecommunications with support from teachers, family members, or student partners.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Sample Performance Task

- Using multimedia software, students communicate ideas through text and graphics by creating letters or class presentations. Proficiency will be determined using a rubric.

Standard 5.0

Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

1.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Use electronic reference tools as a resource.
   b. Evaluate acquired information for usefulness

1.5.2. Students will use technology tools to process data and report results.
   a. Use electronic reference tools as a resource, such as a simple database/spreadsheet
   b. Acquire information from a computer.
   c. Identify the need for data to be organized.
   d. Develop a small basic data base.
   e. Develop a small basic spreadsheet.
   f. Use the computer as a writing tool.

1.5.3. Students will evaluate and select new information resources and technological
   a. Choose an application based on its appropriateness for specific tasks.
   b. Evaluate acquired information for usefulness.
   c. Explore the gathering of information using a variety of electronic resources, including but not limited to the Internet.
   d. Perform an Internet search under the direction and supervision of a teacher.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Performance Indicators
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

- Given a question or a topic related to any content area, the student will use developmentally appropriate technology to respond to the question or collect information on the topic. Proficiency will be determined using a rubric developed by the teacher.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1. Students will use technology resources for solving problems and making informed decisions.
6.2. Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

1.6.1. Students will use technology resources for solving problems and making informed decisions.
   a. Recognize that computers were created to assist in solving problems. (Computer History)
   b. Recognize that the computer relies on sequential steps in order to perform tasks.
   c. Use a step-by-step process for solving a problem.
      1. Order specific steps in the solution of a problem.
      2. Choose the proper steps in the solution of a problem.
      3. Choose and order the steps in the solution of a problem
   d. Use teacher selected websites to acquire information related to a given problem.
      1. Analyze the information gathered
      2. Collaborate with the teacher/student to reach a decision based on the information gathered.

1.6.2. Students will employ technology in the development of strategies for solving problems in the real world.
   a. Use the computer and technology resources to gather information on different ways to solve a specific problem.
   b. Use developmentally appropriate software to follow sequential directions and proper steps to solve a problem for a given simple task.
   c. Use multimedia software to express ideas, strategies use, and solution for a given problem and/or task.
   d. Use some method of storyboarding to create a presentation on the steps used to solve the problem.

Performance Indicators:
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

- Students will use the internet with teacher's assistance to examine selected websites to acquire information and illustrate thoughts, ideas, or stories with multimedia software.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

SECOND GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
1.2. Students will exhibit a proficiency in the use of technology.
1.3. Students will develop basic keying skills (alpha numeric and special characters) in using keyboard using the touch system.

Accomplishments

2.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
   a. Identify the computer as a machine that helps people work and play.
   b. Identify and use input devices such as a disk drive, mouse, keyboard, CD-Drive, etc.
   c. Identify and use output devices such as a disk drive, monitor, printer, CD-Drive, etc.
   d. List the rules for the proper care of computer equipment
   e. Demonstrate proper care for computer and other technologies properly.
   f. Use and apply appropriate computer and keyboarding terminology.
   g. Explore basic navigation of the operating system as it relates to applications used on the computer.
   h. Differentiate between the operating system and an application/program.
   i. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction

2.1.2. Students will exhibit a proficiency in the use of technology.
   a. Demonstrate proper sequence for turning on and turning off computers and other technologies.
   b. Operate a mouse (click, double-click, click and drag, click and hold/draw.
   c. Open/Launch a program/application from an icon
   d. Quit a program/application.
   e. Follow directions in a menu-driven program.
   f. Minimize and maximize windows.

g. Operate stroll bars.
h. Print, save and reopen documents/files with teacher guidance.

2.1.3. Students will develop basic keying skills (alpha/numeric and symbol characters) in using keyboard using the touch system.
   a. Use the correct hand and body position while applying the proper touch method of keying for the home row keys (A, S, D, F, J,K, L, ;); Row above (Q,W,E,R,T,Y,U,I,O,P,[,], \); and Row below (Z,X,C,V,B,N,M,",", ".", /)..
   b. Use appropriate hand pressure on mouse and keyboard.
   c. Operate special purpose keys (return/enter, spacebar, esc, arrows, shift, backspace).
   d. Know the relative position of the alpha/numeric keys.
   e. Color a drawing of the keyboard indicating which finger should operate which keys.
   f. Key words consisting of letters utilizing the home row keys, the row below and the row above using the proper touch keying technique for the development of speed.
   g. Proofread and correct errors using backspace, delete, undo, erase.

Performance Indicators
By the end of the second grade the student will be able to

- use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies.
- use keyboarding skills to produce grade appropriate projects.
- use a variety of media and technology resources for directed and independent learning activities.
- communicate about technology using developmentally appropriate and accurate terminology.
- use developmentally appropriate multimedia resources (e.g., interactive books, educational software, multimedia encyclopedias) to support learning.

Sample Performance Tasks
a. Using pictures of the various parts of a computer (e.g. disk drive, CPU, monitor, keyboard, mouse, etc.) and word cards, students match the words with the pictures and tell what each part does. Using a checklist to evaluate this task, proficiency would include student application of this knowledge to components of a real computer.

b. Using a checklist, students will demonstrate how to turn on the computer, open a designated program, exit that program, and shut down the computer with teacher supervision. Proficiency of this task is met when all items on the list are completed.
c. Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations
2.1 Students will understand the ethical, cultural, and societal issues related to technology.
2.2 Students will practice responsible use of technology systems, information literacy, and software.
2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
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Accomplishments

2.2.1. Students will understand the ethical, cultural, and societal issues related to technology.
a. Demonstrate the safe use of electronic technologies.
b. Identify, discuss and visually represent uses of technology in the community (bar codes, scanners, handheld, etc.).
c. Identify the influence and effects of technology on everyday life and learning.
d. Respect the privacy of others.

2.2.2. Students will practice responsible use of technology systems, information literacy, and software.
a. Understand and follow classroom rules for technology use.
b. Discuss the Acceptable Use Policy.
c. Recognize the importance of supervised use of technology.
d. Identify and discuss appropriate and safe behaviors online.

e. Notify the teacher immediately if an inappropriate website appears when using the internet.
f. Know how "pop-up" windows happen and not to respond to them.

2.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
a. Respect the rights of others.
b. Recognize that technology can be used to assist learning.
c. Discuss ownership of computer-created work.
d. Use teacher selected Internet resources to locate, discuss, and compare information about the local community.

Performance Indicators
By the end of the second grade the student will be able to:
- work cooperatively and collaboratively with peers, family members, and others when using technology.
- demonstrate positive social and ethical behaviors when using technology.
- practice responsible use of technology systems and software.

Sample Performance Task
a. Using pictures from magazines, newspapers, and/or drawings, students will make posters of the different ways computers are used in their lives. The students will then display and explain their choices of pictures.
b. Student will participate in a classroom discussion of responsible use of technology systems and information literacy.

Standard 3.0
Students will use technology productivity tools.

Learning Expectations
3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.
3.2. Students will use productivity tools to collaborate in constructing technology
3.3. enhanced models, prepare publications, and produce other creative works.

Accomplishments
2.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Use the computer and technology resources to practice learning skills such as computer puzzles, matching games, logical thinking programs, etc.
b. Follow directions in a menu-driven program.
c. Identify and explain the function of the icons used in the various programs.
d. Recognize, discuss, and use word processing as a tool to enter, edit, print, and save assignments.
e. Use and discuss basic word processing terms/concepts such as desktop, menu/tool bar, document, text, etc.
f. Use a prepared spreadsheet to enter/edit data and observe the changes that occur to make predictions.
g. Use an age appropriate spreadsheet application to enter, display data as a class/group.
h. Identify various sources of data.

2.3.1. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.
a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
b. Use text, paint, and/or drawing tools to create simple documents.
c. Recognize that different software programs are design for specific purposes.
d. Recognize the characteristics of multimedia (text, audio, images, video, etc.).
e. Identify and discuss multimedia terms/concepts (slide/card, link/button, text box, navigate, transition) as a class/group.
f. Create a simple graph/chart from data in a spreadsheet.
g. Explore the navigation of software utilized in the classroom.

Performance Indicators:
By the end of the second grade the student will be able to:

- Use a variety of media and technology resources for directed and independent learning activities.
- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.
- Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Sample Performance Task

a. *Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.*
b. Following teacher instruction on entering data and making a chart, students will make a graph. This activity will be evaluated through a teacher observation checklist with proficiency shown by the printed graph.

Standard 4.0
Students will use technology communications tools.

Learning Expectations

4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

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Accomplishments

2.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   a. Recognize and discuss telecommunications as a way to share information electronically.
   b. Use multimedia software to communicate information and ideas.
   c. Use the computer as a writing tool.

2.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
   a. Experiment with basic formatting options in a word processor to produce a publication for each of the following: a student, a teacher, a friend, and a parent.
   b. Suggest ways telecommunications can be used to share information electronically.
   c. Explore the use of multimedia software to enhance the communication of information and ideas.

Performance Indicators:
By the end of the second grade the student will be able to:

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Use a variety of media and technology resources for directed and independent learning activities.
- Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.
- Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

a. *Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.*
b. Following teacher instruction on entering data and making a chart, students will make a graph. This activity will be evaluated through a teacher observation checklist with proficiency shown by the printed graph.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.

5.2. Students will use technology tools to process data and report results.

5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

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Accomplishments

2.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Use electronic reference tools as a resource.
   b. Evaluate acquired information for usefulness

2.5.2. Students will use technology tools to process data and report results.
   a. Use electronic reference tools as a resource, such as a simple database/spreadsheet

b. Acquire information from a computer.
c. Identify the need for data to be organized.
d. Develop a small basic data base.
e. Develop a small basic spreadsheet.
f. Use the computer as a writing tool.

2.5.3. Students will evaluate and select new information resources and technological
a. Choose an application based on its appropriateness for specific tasks.
b. Evaluate acquired information for usefulness.
c. Explore the gathering of information using a variety of electronic resources, including but not limited to the Internet.
d. Perform an Internet search under the direction and supervision of a teacher.

Performance Indicators
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

- Given a question or a topic related to any content area, the student will use developmentally appropriate technology to respond to the question or collect information on the topic. Proficiency will be determined using a rubric developed by the teacher.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

2.6.1. Students will use technology resources for solving problems and making informed decisions.
   a. Recognize that computers were created to assist in solving problems. (Computer History)
   b. Recognize that the computer relies on sequential steps in order to perform tasks.
   c. Use a step-by-step process for solving a problem.
      1. Order specific steps in the solution of a problem.
      2. Choose the proper steps in the solution of a problem.
      3. Choose and order the steps in the solution of a problem
   d. Use teacher selected websites to acquire information related to a given problem.
      1. Analyze the information gathered
      2. Collaborate with the teacher/student to reach a decision based on the information gathered.
      3. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction.

2.6.2. Students will employ technology in the development of strategies for solving problems in the real world.
   a. Use the computer and technology resources to gather information on different ways to solve a specific problem.
   b. Use developmentally appropriate software to follow sequential directions and proper steps to solve a problem for a given simple task.
   c. Use multimedia software to express ideas, strategies use, and solution for a given problem and/or task.
   d. Use some method of storyboarding to create a presentation on the steps used to solve the problem.

Performance Indicators:
By the end of the second grade the student will be able to:

- use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.

Sample Performance Task

a. Students will use the internet with teacher's assistance to examine selected websites to acquire information and illustrate thoughts, ideas, or stories with multimedia software.
b. Using a checklist, students will demonstrate how to turn on the computer, open a designated program, exit that program, and shut down the computer with teacher

supervision. Proficiency of this task is met when all items on the list are completed.

c. Using a word-processing and drawing program, students write statements, use computer drawing tools to illustrate their statements, and print them out for presentation to the class. Using a rubric to evaluate this task, proficiency will show accurate use of word-processing, drawing and printing.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

THIRD GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
1.2. Students will exhibit a proficiency in the use of technology.
1.3. Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system

Accomplishments

3.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
   a. Identify the functions of computer components.
   b. Use input devices, such as mouse, keyboard, and voice/sound recorder.
   c. Use output devices, such as disk drive, printer, multimedia projector/display screen, etc.
   d. Save, retrieve, and delete files.
   e. Describe the purposes of drives, directories, and files.
   f. Be aware that there are different types of files (different extensions).
   g. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction

3.1.2. Students will exhibit a proficiency in the use of technology.
   a. Use and apply appropriate computer terminology.
   b. Demonstrate the proper sequence of steps to operate a computer.
   c. Identify the file extension for word processing, spreadsheet, and data base files.
   d. Save to a specific directory or drive.
   e. Expand the use of various operating system features such as, opening more than one application/program, the menus, the taskbar, etc.

3.1.3. Students will develop basic skills (alpha-numeric and symboll characters) in using keyboard using the touch system
   a. Exhibit proper posture and fingering techniques for the alphanumeric keyboard.
   b. Review and expand proper touch-keying techniques for the home row, top row (Q,W,E,R,T,Y,U,I,O,P,[,],\), bottom (Z,X,C,V,B,N,M, “,”,”.”).

c. Continue practice using the shift keys.
d. Apply the touch-keying system to develop basic skills on the alphanumeric keyboard at a rate of 10 gross words per minute

Performance Indicators:
By the end of the **third** grade the student is able to

- Key at a rate of 10 gross words per minute using the proper touch-keying techniques.

By the end of the **fifth** grade the student is able to

- Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively.
- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.

Sample Performance Task

- Using any word processing or keyboard program the students will take a timed typing test to determine their gross words per minute(GWAM).

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.
2.2 Students will practice responsible use of technology systems, information, and software.
2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

3.2.1. Students will understand the ethical, cultural, and societal issues related to technology.
a. Describe the role of machines in assisting man
b. Identify the various people involved in technological developments.
c. Identify historical aspects of technology.
d. Distinguish between human capabilities and computer capabilities
e. Discuss copyright laws.
f. Discuss the advantages and disadvantages of the use of technology.

3.2.2. Students will practice responsible use of technology systems, information, and software.

a. Adhere to software licensing agreements and respect the electronic work of other individuals.
b. Obey the copyright laws.
c. Follow Acceptable Use Guidelines as set by local school district.
d. Discuss the advantages and disadvantages of the use of technology
e. Cite sources of information (print and nonprint) for class assignments.

3.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
a. List ways technology makes life easier for us today.
b. Compare and contrasts the advantages and disadvantages of the use of technology.
c. Practice safe use of electronic equipment.
d. Discuss the purpose of virus protection software.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.
- Discuss basic issues related to responsible use of technology and describe personal consequences of inappropriate use.

Sample Performance Tasks

a. Classroom discussion of Acceptable Use Policy.
b. Using a word processor briefly describe the advantages and disadvantages technology has brought to our lives. Essays scored to a rubric.

Standard 3.0
Students will use technology productivity tools.
Learning Expectations

3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.
3.2 Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments

3.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Discuss the reasons computers are best suited for task requiring speed, accuracy, and repeated operations.
b. Use the computer and technology resources as a learning tool.
c. Use the computer and technology resources as a writing tool.
d. Use paint and draw tools to create graphics.
e. Import graphics from clip art galleries.
f. Create slide shows.
g. Use on-line help and documentation (help buttons/menus/guides, readme files, Ask an Expert web sites, electronic tech support).

3.3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.
a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
b. Use text, paint, and/or drawing tools to create simple documents.
c. Recognize that different software programs are design for specific purposes.
d. Recognize the characteristics of multimedia (text, audio, images, video, etc.).
e. Identify and discuss multimedia terms/concepts (slide/card, link/button, text box, navigate, transition) as a class/group.
f. Create a simple graph/chart from data in a spreadsheet.
g. Explore the navigation of software utilized in the classroom.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum.
- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.

Sample Performance Task

- Students will create independent and collaborative multimedia products using a variety of presentation tools to be scored by classroom created rubric.

Standard 4.0

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Students will use technology communications tools.

Learning Expectations

4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

3.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

a. Use communication tools to participate in projects.
b. Explore effective ways to demonstrate ideas (font, color, background/white space, graphics, and sound to ensure that products are appropriate for the communication media including multimedia screen displays, Internet documents, and printed materials).
c. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
d. Use presentation software to create a product geared to specific audiences.
e. Select representative student products to be collected and stored in an electronic evaluation tool.
f. Participate in the creation of technology assessment tools such as checklists, timelines, or rubrics.
g. Use outlining tools to create simple presentation templates.
h. Where applicable, log-on to an e-mail server with user name and password, send, retrieve, and read e-mail messages.

3.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

a. Explore principals design (proportion, balance, contrast, rhythm, emphasis, unity, etc., in creating a presentation/document.
b. Use appropriate applications, including, but not limited to spreadsheets and databases to develop charts and graphs by using data from various sources.
c. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
d. Use presentation software to communicate with specific audiences.
e. Integrate various media (video tape, CD-ROM, laserdisc, digital sources, internet, etc. in a multimedia presentation.
f. Select representative student products to be collected and stored in an electronic evaluation tool.
g. Evaluate student products for relevance to the assignment or task.

h. Be aware that file size is important, plan, organize and save multimedia files with attention to file size and media storage.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.
- Use telecommunications efficiently to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.
- Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom.

Sample Performance Task

- Given a topic the student will choose the appropriate software and hardware to effectively communicate to a given audience.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

3.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Perform simple searches to acquire information
   b. Select appropriate strategies to navigate and access information on local area networks (printer, local servers, CD-ROM towers…) and wide area networks (Internet, WWW, telecommunications…) for research and resource sharing

c. Use electronic reference materials including encyclopedias, thesauruses, dictionaries, maps and atlases, etc.
d. Use an electronic library to search for information related to a project (TEL).

3.5.2. Students will use technology tools to process data and report results.
a. Use electronic reference tools as a resource, such as a simple database/spreadsheet
b. Identify the need for data to be organized.
c. Develop a small basic data base.
d. Identify advantages and disadvantages of a data base.
e. Demonstrate the process through which computers search, sort, delete, update and summarize data.
f. Develop a small basic spreadsheet.
g. Use the computer as a writing tool.

2.5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks
a. Choose an application based on its appropriateness for specific tasks.
b. Evaluate acquired information for usefulness.
c. Explore the gathering of information using a variety of electronic resources, including but not limited to the Internet.
d. Perform an Internet search under the direction and supervision of a teacher.
e. Use interactive technology environments, such as simulations, electronic science or mathematics laboratories, virtual museum field trips, or on-line interactive lessons to extend learning.

Performance Indicators:
By the end of the fifth grade the student is able to:
- Use a variety of technology resources for problem solving, self-directed learning, and extended learning activities.
- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Sample Performance Task:
- Use technology resources to research then create a product on a given topic.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

3.6.1. Students will use technology resources for solving problems and making informed decisions.

a. Recognize that computers were created to assist in solving problems. (Computer History)
b. Recognize that the computer relies on sequential steps in order to perform tasks.
c. Use a step-by-step process for solving a problem.
    1. Order specific steps in the solution of a problem.
    2. Choose the proper steps in the solution of a problem.
    3. Choose and order the steps in the solution of a problem
d. Use teacher selected websites to acquire information related to a given problem.
    1. Analyze the information gathered
    2. Collaborate with the teacher/student to reach a decision based on the information gathered.

3.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

a. Use the computer and technology resources to gather information on different ways to solve a specific problem.
b. Use developmentally appropriate software to follow sequential directions and proper steps to solve a problem for a given simple task.
c. Use multimedia software to express ideas, strategies use, and solution for a given problem and/or task.
d. Use some method of storyboarding to create a presentation on the steps used to solve the problem.
e. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction

Performance Indicators:

By the end of the fifth grade the student is able to:

- Use technology resources for problem solving, self-directed learning, and extended learning activities.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.
- Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Sample Performance Task:

a. Share student performance based products using a variety of tools and electronic devices.
b. Given teacher selected sites the student will evaluate the validity and bias of the information on a given topic.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

FOURTH GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1 Students will demonstrate an understanding of the nature and operation of technology systems.
1.2 Students will exhibit a proficiency in the use of technology.
1.3 Students will continue development of and master basic skills (alpha numeric and special characters) for using the touch.
NOTE: The first 6 to 8 weeks of class will emphasize the mastery of the touch system of keying on the alphanumeric keyboard.

Accomplishments

4.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
a. Identify the functions of computer components.
b. Use input devices, such as mouse, keyboard, and voice/sound recorder.
c. Use output devices, such as disk drive, printer, multimedia projector/display screen, etc.
d. Save, retrieve, and delete files.
e. Describe the purposes of drives, directories, and files.
f. Be aware that there are different types of files (different extensions).
g. Recognize, discuss, and use network term/concepts such as stand alone, network, file server, LANs, network resources, etc.
h. Identify and discuss the benefits of non-networked and networked computers.
i. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction

4.1.2. Students will exhibit a proficiency in the use of technology.
a. Use and apply appropriate computer terminology.
b. Demonstrate the proper sequence of steps to operate a computer.
c. Recognize the different types of file extensions and their respective document types, such as picture, bitmap, photo, word processing document, spreadsheet document, etc.
d. Save to and retrieve from a specific directory or drive.

e. Expand the use of various operating system features such as, opening more than one application/program, the menus, the taskbar, etc.

4.1.3. Students will develop basic skills (alpha numeric and symbol characters) in using keyboard using the touch system
   a. Exhibit proper posture and use both hands at the keyboard.
   b. Exhibit proper posture and fingering techniques for the alphanumeric keyboard.
   c. Review and expand proper touch-keying techniques for all rows of the keyboard.
   d. Apply the touch-keying system to develop basic skills on the alphanumeric keyboard at a rate of 15 gross words per minute (GWAM) for a one minute timed writing.
   e. Practice proper response patterns to gain speed.
   f. Build speed and accuracy.

Performance Indicators:
By the end of the fourth grade the student is able to
- Master the correct touch-keying techniques for the alphanumeric keyboard
- Key at a rate of 15 gross words per minute (GWAM) using the proper touch-keying techniques in a one minute timed writing.

By the end of the fifth grade the student is able to
- Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively.
- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.
- Demonstrate the proper use of computer and keyboarding terminology

Sample Performance Task
- Using any word processing or keyboard program the students will take a timed typing test to determine their gross words per minute.
- Use a technique check sheet to evaluate proper techniques at the keyboard.
- Perform drills on sentences and paragraph from straight copy.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

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Section 1 – Literacy and Usage

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.

2.2 Students will practice responsible use of technology systems, information, and software.

2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

4.2.1. Students will understand the ethical, cultural, and societal issues related to technology.

a. Describe the role of machines in assisting man
b. Identify the various people involved in technological developments.
c. Identify the historical developments of technology
d. Discuss the impact of the historical developments of technology on society..
e. Distinguish between human capabilities and computer capabilities
f. Discuss copyright laws.
g. Discuss the advantages and disadvantages of the use of technology.
h. Identify the influence and affects of technology in our daily lives and learning.

4.2.2. Students will practice responsible use of technology systems, information, and software.

a. Adhere to software licensing agreements and respect the electronic work of other individuals.
b. Obey the copyright laws.
c. Follow Acceptable Use Guidelines as set by local school district.
d. Discuss the advantages and disadvantages of the use of technology related to
e. Recognize and discuss the importance of citing sources of copyrighted materials in documents.
f. List ways of obtaining permission for using copyrighted material.
g. Follow commercial licensing agreements for software packages.

4.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

a. List ways technology makes life easier for us today.
b. Compare and contrasts the advantages and disadvantages of the use of technology.
c. Practice safe use of electronic equipment.
d. Discuss the purpose of virus protection software.

e. Explore technology related careers.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.
- Discuss basic issues related to responsible use of technology and describe personal consequences of inappropriate use.

Sample Performance Tasks

- Classroom discussion of Acceptable Use Policy.
- Using a word processor briefly describe the advantages and disadvantages technology has brought to our lives. Essays scored to a rubric.

Standard 3.0
Students will use technology productivity tools.

Learning Expectations

3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2 Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments

4.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Discuss the reasons computers are best suited for task requiring speed, accuracy, and repeated operations.
b. Use the computer and technology resources as a learning tool.
c. Create presentations for various subject related assignments.
d. Use simulation software to assist with learning.
e. Use on-line help and documentation (help buttons/menus/guides, readme files, Ask an Expert web sites, electronic tech support).

4.3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.

a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
b. Use text, paint, and/or drawing tools to assist with learning tasks.

c. Recognize that different software programs are design for specific purposes.
d. Recognize the characteristics of multimedia (text, audio, images, video, etc.).
e. Identify and discuss multimedia terms/concepts (slide/card, link/button, text box, navigate, transition) as a class/group.
f. Explore the navigation of software utilized in the classroom.
g. Correctly perform the following basic skills in word processing and spreadsheet programs: highlight, cut and paste, delete, exit, search and replace, enter data, open two programs simultaneously and move between them.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum.
- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.

Sample Performance Task

- Students will create independent and collaborative multimedia products using a variety of presentation tools to be scored by classroom created rubric.

Standard 4.0
Students will use technology communications tools.

Learning Expectations

4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

4.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
a. Use communication tools to participate in projects.

b. Explore effective ways to demonstrate ideas (font, color, background/white space, graphics, and sound to ensure that products are appropriate for the communication media including multimedia screen displays, Internet documents, and printed materials).
c. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
d. Use presentation software to create a product geared to specific audiences.
e. Participate in the creation of technology assessment tools such as checklists, timelines, or rubrics.
f. Use outlining tools to create simple presentation templates.
g. Where applicable, log-on to an e-mail server with user name and password, send, retrieve, and read e-mail messages.
h. Where applicable, participate in electronic communications as learners, initiators, contributors, and mentors in online projects guided by the teacher.

4.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
a. Explore principles of design (proportion, balance, contrast, rhythm, emphasis, unity, etc., in creating a presentation/document.
b. Use appropriate applications, including, but not limited to spreadsheets and databases to develop charts and graphs by using data from various sources.
c. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
d. Use presentation software to communicate with specific audiences.
e. Integrate various media (video tape, CD-ROM, laserdisc, digital sources, internet, etc. in a multimedia presentation.
f. Select representative student products to be collected and stored in an electronic evaluation tool.
g. Evaluate student products for relevance to the assignment or task.
h. Be aware that file size is important, plan, organize and save multimedia files with attention to file size and media storage.

Performance Indicators:
By the end of the fourth grade the student is able to:

- Apply all the touch-keying techniques for the keyboard, expect the numeric keypad.

By the end of the fifth grade the student is able to:

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- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.
- Use telecommunications efficiently to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.
- Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom.

Sample Performance Task

- Given a topic the student will choose the appropriate software and hardware to effectively communicate to a given audience.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations
5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments
4.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
a. Select appropriate strategies to navigate and access information on local area networks (printer, local servers, CD-ROM towers…) and wide area networks (Internet, WWW, telecommunications…) for research and resource sharing.
b. Perform simple searches to acquire information
c. Skim and scan for main ideas and keywords to identify relevant information.
d. Use electronic reference materials including encyclopedias, thesauruses, dictionaries, maps and atlases, etc.
e. Use an electronic library to search for information related to a project (TEL).

4.5.2. Students will use technology tools to process data and report results.
   a. Use electronic reference tools as a resource.
   b. Identify the need for data to be organized.
   c. Develop a small basic data base.
   d. Identify advantages and disadvantages of a data base.
   e. Demonstrate the process through which computers search, sort, delete, update and summarize data..
   f. Use age appropriate software programs to generate tables, charts, and graphs to display data in various curricular areas.

4.5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks
   a. Have experiences with a variety of software and specify their uses such as, reference material, browsers, drawing, publishing, and word processing programs, etc.
   b. Choose an application based on its appropriateness for specific tasks.
   c. Evaluate acquired information for usefulness.
   d. Explore the gathering of information using a variety of electronic resources, including but not limited to the Internet.
   e. Perform an Internet search under the direction and supervision of a teacher.
   f. Use interactive technology environments, such as simulations, electronic science or mathematics laboratories, virtual museum field trips, or on-line interactive lessons to extend learning.

Performance Indicators:
By the end of the fifth grade the student is able to:
- Use a variety of technology resources for problem solving, self-directed learning, and extended learning activities.
- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Sample Performance Task:
- Use technology resources to research then create a product on a given topic.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

4.6.1. Students will use technology resources for solving problems and making informed decisions.

a. Recognize that computers were created to assist in solving problems. (Computer History)
b. Recognize that the computer relies on sequential steps in order to perform tasks.
c. Use a step-by-step process for solving a problem.
    1. Order specific steps in the solution of a problem.
    2. Choose the proper steps in the solution of a problem.
    3. Choose and order the steps in the solution of a problem
d. Use teacher selected websites to acquire information related to a given problem.
    1. Analyze the information gathered
    2. Collaborate with the teacher/student to reach a decision based on the information gathered.

4.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

a. Use the computer and technology resources to gather information on different ways to solve a specific problem.
b. Determine the usefulness and appropriateness of electronic information and apply critical analysis to resolve conflicts (discrepancies between sources) and validate information.
c. Use developmentally appropriate software to follow sequential directions and proper steps to solve a problem for a given simple task.
d. Use multimedia software to express ideas, strategies use, and solution for a given problem and/or task.
e. Use some method of storyboarding to create a presentation on the steps used to solve the problem.
f. OPTIONAL – If available, use a computer program, such as LOGO to demonstrate how computers use instruction.

Performance Indicators:

By the end of the fifth grade the student is able to:

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Use technology resources for problem solving, self-directed learning, and extended learning activities.
- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.
- Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Sample Performance Task:

a. Share student performance based products using a variety of tools and electronic devices.
b. Given teacher selected sites the student will evaluate the validity and bias of the information on a given topic.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

FIFTH GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
1.2. Students will exhibit a proficiency in the use of technology.
1.3. Students will demonstrate proper keyboarding skills using the touch system of keying..

Accomplishments

5.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
   a. Use and apply appropriate computer terminology.
   b. Exhibit proper posture and fingering techniques at the keyboard.
   c. Work with more than one software application at a time.

5.1.2. Students will exhibit a proficiency in the use of technology.
   a. Use and apply appropriate computer terminology.
   b. Understand the differences in file formats and compatibility.
   c. Recognize telecommunications as a way to share information electronically.
   d. Develop skills in using function keys and keyboard short cuts.

5.1.3. Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system
   a. Exhibit proper posture and fingering techniques for the alphanumeric keyboard.
   b. Use and apply appropriate keyboarding terminology.
   c. Review and demonstrate proper touch-keying techniques for all alpha, numeric and symbol keys.
   d. Apply the touch-keying system to develop basic skills on the alphanumeric keyboard at a rate of 20 gross words per minute (GWAM) for a 2 minute straight copy timed writing.
   e. Key a simple letter to include alpha, numeric, and appropriate symbol keys such as periods, question marks, etc.

Performance Indicators:
By the end of the fifth grade the student is able to

- Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively.
- Key at a rate of 20 gross words per minute using the proper touch-keying

techniques on a 2 minute timed writing.
- Key a simple letter with two paragraphs with no more than two mistakes.
- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.

Sample Performance Task

- Using any word processing or keyboard program the students will take a timed keying test to determine their gross words per minute.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.

2.2 Students will practice responsible use of technology systems, information, and software.

2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

5.2.1. Students will understand the ethical, cultural, and societal issues related to technology.

a. Adhere to software licensing agreements and respect the electronic work of other individuals.
b. Obey the copyright laws and accurately record information source.
c. Discuss the advantages and disadvantages of the use of technology.
d. Recognize the need for equal access to materials and resources.
e. Recognize the need for specific access to assistive devices.

5.2.2. Students will practice responsible use of technology systems, information, and software.

a. Adhere to software licensing agreements and respect the electronic work of other individuals
b. Practice and respect the copyright laws and accurately record information source
c. Follow Acceptable Use Guidelines as set by local school district
d. Discuss the impact of viruses as to the advantages and disadvantages of the use of technology
e. Know and use rules of “Netiquette.”

5.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
   a. Analyze the advantages and disadvantages of the use of technology with respect to personal safety, ethics, and efficiency.
   b. Practice safe use of the electronic equipment.

Performance Indicators:
By the end of the fifth grade the student is able to:
- Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide.
- Discuss basic issues related to responsible use of technology and describe personal consequences of inappropriate use.

Sample Performance Tasks
a. Classroom discussion of Acceptable Use Policy.
b. Using a word processor briefly describe the advantages and disadvantages technology has brought to our lives. Essays scored to a rubric.
c. Compose and key an essay concerning the impact of technology on our daily lives.

Standard 3.0
Students will use technology productivity tools.

Learning Expectations
3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.
3.2 Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments
5.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.
   a. Use subject specific information gathered through technology resources for a variety of curriculum subjects.
   b. Create presentations for various subject related assignments.
   c. Use simulation software and tutorial software to assist with learning.
   d. Use on-line help and documentation (help buttons/menus/guides, readme files, Ask an Expert web sites, electronic tech support).

5.3.2. Students will use productivity tools to collaborate in constructing technology enhanced models, prepare publications, and produce other creative works.

a. Use the computer and technology resources to practice learning skills in relation to other subject areas such as math, science, English, etc.
b. Recognize that different software programs are design for specific purposes.
c. Use the characteristics of multimedia (text, audio, images, video, etc.) in presentations
d. Identify and discuss multimedia terms/concepts (slide/card, link/button, text box, navigate, transition) as a class/group.
e. Use a age appropriate web authoring tool to compose text, create hyperlinks, and add relevant multimedia.
f. Explore the navigation of software utilized in the classroom.
g. Correctly perform the following basic skills in word processing and spreadsheet programs.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum.
- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.

Sample Performance Task

- Students will create independent and collaborative multimedia products using a variety of presentation tools to be scored by classroom created rubric.

Standard 4.0
Students will use technology communications tools.

Learning Expectations

4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

5.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
a. Use communication tools to participate in projects.

b. Explore effective ways to demonstrate ideas (font, color, background/white space, graphics, and sound to ensure that products are appropriate for the communication media including multimedia screen displays, Internet documents, and printed materials).
c. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
d. Use presentation software to communicate with specific audiences.
e. Select representative student products to be collected and stored in an electronic evaluation tool.
f. Participate in the creation of technology assessment tools such as checklists, timelines, or rubrics.

5.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
a. Demonstrate sensitivity to appropriate language use when communicating.
b. Explore principles of design (proportion, balance, contrast, rhythm, emphasis, unity, etc., in creating a presentation/document.
c. Use appropriate applications, including, but not limited to spreadsheets and databases to develop charts and graphs by using data from various sources.
d. Publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video.
e. Use presentation software to communicate with specific audiences.
f. Integrate various media (video tape, CD-ROM, laserdisc, digital sources, internet, etc. in a multimedia presentation.
g. Select representative student products to be collected and stored in an electronic evaluation tool.
h. Evaluate student products for relevance to the assignment or task.
i. Be aware that file size is important, plan, organize and save multimedia files with attention to file size and media storage.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.
- Use telecommunications efficiently to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests.
- Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for

the purpose of developing solutions or products for audiences inside and outside the classroom.

Sample Performance Task

- Given a topic the student will choose the appropriate software and hardware to effectively communicate to a given audience.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

5.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Perform simple searches to acquire information such as text, audio, video, graphics, and online help, using CD-ROM and online databases.
   b. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean (and, or, not) search strategies.
   c. Select appropriate strategies to navigate and access information on local area networks (printer, local servers, CD-ROM towers…) and wide area networks (Internet, WWW, telecommunications…) for research and resource sharing.
   d. Distinguish between statements of fact and opinion.
   e. Evaluate resources for accuracy, authority, reliability, currency and relevance.

5.5.2. Students will use technology tools to process data and report results.
   a. Create an outline for a report using information from resources and reference sources..
   b. Synthesize information using word processing, databases, and/or spreadsheets.

5.5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
   a. Perform searches to acquire information such as text, audio, video, graphics, and online help, using CD-ROM and online databases.
   b. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean (and, or, not) search strategies.

c. Evaluate acquired information for validity and usefulness.
d. Select appropriate strategies to navigate and access information on local area networks (printer, local servers, CD-ROM towers…) and wide area networks (Internet, WWW, telecommunications…) for research and resource sharing.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use a variety of technology resources for problem solving, self-directed learning, and extended learning activities.
- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.

Sample Performance Task:

- Use technology resources to research then create a product on a given topic.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.
6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

5.6.1. Students will use technology resources for solving problems and making informed decisions.
a. Determine the usefulness and appropriateness of electronic information and apply critical analysis to resolve conflicts (discrepancies between sources) and validate information.
b. Use software programs with audio, video, and graphics to enhance learning experiences
c. Use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia.
d. Use a variety of data types including text, graphics, digital audio, and video.
e. Use communication tools to participate in projects (e.g. telephone, fax machine, email)
f. Use software features, such as built-in or on-line help.
g. Use software features, such as slide show previews, to evaluate a final product.

h. Use a graphical organizer and/or outliner to categorize, make connections, and visually display relationships (cause and effect, Venn Diagrams and hierarchical organization).

5.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

a. Determine the usefulness and appropriateness of electronic information and apply critical analysis to resolve conflicts (discrepancies between sources) and validate information.
b. Use software programs with audio, video, and graphics to enhance learning experiences.
c. Use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia.
d. Use a variety of data types including text, graphics, digital audio, and video.
e. Use communication tools to participate in projects (e.g., telephone, fax machine, email).
f. Use interactive technology environments, such as simulations, electronic science or mathematics laboratories, virtual museum field trips, or on-line interactive lessons, to extend learning.
g. Use software features, such as built-in or on-line help.
h. Use software features, such as slide show previews, to evaluate a final product.
i. OPTIONAL – If available, use a computer program, such as LOGO/HTML to demonstrate how computers use instruction.

Performance Indicators:
By the end of the fifth grade the student is able to:

- Use technology resources for problem solving, self-directed learning, and extended learning activities.
- Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.
- Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Sample Performance Task:

a. Share student performance based products using a variety of tools and electronic devices.
b. Given teacher selected sites the student will evaluate the validity and bias of the information on a given topic.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

SIXTH GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1 Students will demonstrate an understanding of the nature and operation of technology systems.
1.2 Students will be proficient in the use of technology.
1.3 Students will apply the touch system of keying when using the computer keyboard for input.

Accomplishments

6.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
- a. • Demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components.
  1. Manipulate icons on the desktop, create folders, and store files within the folder.
  2. Use different software programs (word processor, spreadsheets, etc.).
  3. Maintain a current vocabulary of networking terms.
- b. • Use technology terminology appropriate to the task.
- c. • Use appropriate Internet terminology.

6.1.2. Students will be proficient in the use of technology.
- a. • Compare, contrast, and appropriately use various input, output, and primary/secondary storage devices.
  1. Use a mouse, keyboard, and scanner correctly.
  2. Organize files on a computer disk, hard drive, server, or other storage device.
  3. Print reports based on a sort and query
- b. • Perform basic software application functions.
  1. Type, edit, and print a document.
  2. Create a chart that visually represents data.
  3. Import graphics with appropriate placement.

6.1.3. Students will apply basic skills (alpha numeric and special characters) in using keyboard using the touch system

a. Using appropriate ergonomics, apply the touch system on the alpha, numeric, and symbol keys at a rate of 20 net words per minute.
b. Apply the touch system to the numeric keypad
c. Key a letter to include all parts of the letter. The body should be at least two praragraphs.

Performance Indicators

By the end of the seventh grade the student is able to:

- Key at a rate of at least 20 net words per minute using the proper touch-keying techniques on a two minute timed writing.

By the end of the eighth grade the student is able to:

- Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.

Sample Performance Task

Using a selected piece of software student will demonstrate that a computer needs instructions from system software to operate applications. Students model a teacher demonstration of sequential instructions to print, sort, calculate and perform other functions. The student will also discuss the us of binary codes in the operations of a computer.. Proficiency is determined by student utilization of software specific to the computer and the successful completion of assigned tasks as observed by the teacher.

The student will key an assigned project applying the tough method of keying and incorporating the use of different function and formatting skills.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.

2.2 Students will practice responsible use of technology systems, information, and software.

2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

6.2.1. Students will understand the ethical, cultural, and societal issues related to technology.

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
   2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
   3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
b. Discuss current changes in information technologies and how those changes affect society and the workplace.
c. Discuss the cultural impact of global communication.

6.2.2. Students will practice responsible use of technology systems, information, and software.

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
   2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
   3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
b. Understand the concept of intellectual freedom.
c. Appy time and access constraints when using electronic resources.
d. Demonstrate knowledge of responsible, safe, effective and efficient use of telecommunication/Internet.
e. Demonstrate knowledge of responsible, safe, and ethical use of networked digital information.

6.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
   a. • Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
      1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
      2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
      3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
      4. Implement safe personal practices when using the Internet.
   b. Practice safe use of electronic technology.

Performance Indicators
By the end of the eighth grade the student will be able to:

- Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.
- Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Sample Performance Task

a. During appropriate curricular activities students will verbally describe when and how technology is used in everyday life and occupations. Using observation, teachers will develop a rubric evaluating the behavior of the students as they use technology in content area lessons.
b. Develop situational examples to test concepts of piracy.

Integration/Thematic Connections
See links on Tennessee State website @ _____.
Subjects such as Language Arts, Social Studies, and Science should apply citation of sources and piracy issues as they write and research from the Internet

Standard 3.0
Students will use technology productivity tools.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2. Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments

6.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Demonstrate proficiency in the use of a variety of input devices, such as mouse/track pad, keyboard, microphone, digital camera, printer, scanner, disk/disc, modem, CD-ROM, or joystick.

b. Use digital keyboarding standards for data input such as spacing after punctuation and quotation marks.

6.3.2. Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

a. Use productivity tools to create effective document files for defined audiences such as slide shows, posters, multimedia presentations, newsletters, brochures, or reports.

b. Demonstrate appropriate use of fonts, styles, and sizes, as well as effective use of graphics and page design to create a report or a presentation.

c. Demonstrate the ability to select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency.

1. Choose the correct software (e.g., word processor, database, or spreadsheet) per task.
2. Create projects for different audiences (e.g., peers or community) .

Performance Indicators

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.

Sample Performance Task

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Students will design a slide-show presentation on a topic of their choice. The students will be assessed using a teacher designed rubric.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Standard 4.0
Students will use technology communications tools.

Learning Expectations
4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.

4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments
6.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences by:.
   a. Using multimedia authoring programs to create linear or non-linear projects incorporating text, audio, video, and/or graphics.
   b. Creating a document using desktop publishing techniques including, but not limited to, the creation of multi-column or multi-section documents with a variety of text-wrapped frame formats.

6.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences by:
   a. Planning, creating, and editing documents created with a word processor using readable fonts, alignment, page setup, tabs, and ruler settings.
   b. Creating and editing spreadsheet documents using all data types, formulas and functions, and chart information.

Performance Indicators

- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences.
- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences.

Sample Performance Task

- Using Internet resources students will construct a timeline listing historical aspects of computing. The students should select the appropriate software to complete the task. The timeline describes early and modern methods of computing and identifies people involved in computing. Students compare and

contrast generations of computers and project future technology trends. Students will print their projects and share results with the class.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

6.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Apply appropriate electronic search strategies in the acquisition of information including keyword and/or Boolean search strategies.
   b. Use on-line help and other documentation.
6.5.2. Students will use technology tools to process data and report results.
   a. Apply appropriate electronic search strategies in the acquisition of information including keyword and/or Boolean search strategies.
   b. Use the appropriate software package(s) to process data and report data.
6.5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
   a. Evaluate the electronic information for accuracy and validity.
   b. Identify the source and location of available information.

Performance Indicators

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.
- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.

Sample Performance Task

- Using a related curriculum topic, students will create collaboratively a multimedia (sound, pictures, and text) project utilizing library and classroom resources to access, analyze, interpret and synthesize information. During the time frame of project development students will take responsibility for copyrights of software and Internet resources. The teacher will use rubrics to evaluate this task including evidence of a variety of resources used to create original presentations concerning real-world problems.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations
6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Accomplishments

6.6.1. Students will use technology resources for solving problems and making informed decisions.
   a. Use technology in self-directed activities by sharing products for defined audiences.
      1. Create a document using a word processor to share with the class.
      2. Create presentations for extra-curricular activities (e.g., science fair, 4-H, or parent/teacher organizations).
   b. Integrate acquired technology applications skills, strategies, and use of the word processor, database, spreadsheet, telecommunications, draw, paint, and/or utility programs into the foundation and enrichment curricula.
      1. Compose essays or reports using a word processor.
      2. Create charts and graphs using a spreadsheet.

6.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

6.6.3. Students will demonstrate knowledge of the relevancy of technology to life-long learning and daily living.
   a. Discuss uses of technology at home.
   b. Compare technology of the past with the present.

6.6.4. Students will use technology resources (e.g., calculators, videos, educational software) for self-directed learning, problem solving and extended learning activities.
   a. Describes more than one problem-solving method.
   b. Selects an appropriate problem-solving method.
   c. Generate a desired outcome using a problem-solving method.

Performance Indicators

- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Sample Performance Task

- The student will develop a storyboard to establish a sequence for analyzing and performing a task. The teacher will use a rubric to evaluate flow chart construction and accuracy in relation to the storyboard.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

COMPUTER EDUCATION

SEVENTH GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1 Students will demonstrate an understanding of the nature and operation of technology systems.
1.2 Students will be proficient in the use of technology.
1.3 Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system

Accomplishments

71.1. Students will demonstrate an understanding of the nature and operation of technology systems.
   a. • Demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components.
      1. Manipulate icons on the desktop, create folders, and store files within the folder.
      2. Use different software programs (word processor, spreadsheets, etc.).
      3. Maintain a current vocabulary of networking terms.
   b. Use technology terminology appropriate to the task.
   c. Use appropriate Internet terminology.

71.2. Students will be proficient in the use of technology.
   a. Compare, contrast, and appropriately use various input, output, and primary/secondary storage devices.
      1. Use a mouse, keyboard, and scanner correctly.
      2. Organize files on a computer disk, hard drive, server, or other storage device.
      3. Print reports based on a sort and query
   b. Apply proper erogonomic form in applying the touch system of keying the alpha, numeric and symbol keys at a rate of 20 net words per minute.
   c. Perform basic software application functions.
      1. Type, edit, and print a document.
      2. Create a chart that visually represents data.
      3. Import graphics with appropriate placement.

71.3. Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system
   a. Using appropriate ergonomics, apply the touch system on the alpha, numeric, and symbol keys at a rate of at least 30 net words per minute.
   b. Apply the touch system to the numeric keypad

Performance Indicators

By the end of the eighth grade the student is able to:

- Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.
- Key at a rate of at least 30 net words per minute using the proper touch-keying techniques.
-

Sample Performance Task

- Using a selected piece of software student will demonstrate that a computer needs instructions from system software to operate applications. Students model a teacher demonstration of sequential instructions to print, sort, calculate and perform other functions. The student will also explain that a computer uses binary codes to implement functions. Proficiency is determined by student utilization of software specific to the computer and the successful completion of assigned tasks as observed by the teacher.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.

2.2 Students will practice responsible use of technology systems, information, and software.

2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

7.2.1. Students will understand the ethical, cultural, and societal issues related to technology.

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
   2. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.

b. Discuss current changes in information technologies and how those changes affect society and the workplace.

c. Discuss the cultural impact of global communication.

7.2.2. Students will practice responsible use of technology systems, information, and software.

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
   2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
   3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.

b. Understand the concept of intellectual freedom.

c. Apply time and access constraints when using electronic resources.

d. Demonstrate knowledge of responsible, safe, effective and efficient use of telecommunication/Internet.

e. Demonstrate knowledge of responsible, safe, and ethical use of networked digital information.

7.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.]
   2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
   3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
   4. Implement safe personal practices on the Internet.
b. Demonstrate proper use of electronic equipment.

Performance Indicators
The student will be able to:

- Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.
- Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Sample Performance Task

a. During appropriate curricular activities students will verbally describe when and how technology is used in everyday life and occupations. Using observation, teachers will develop a rubric evaluating the behavior of the students as they use technology in content area lessons.
b. Develop situational examples to test concepts of piracy.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Subjects such as Language Arts, Social Studies, and Science should apply citation of sources and piracy issues as they write and research from the Internet

Standard 3.0
Students will use technology productivity tools

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2 Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments

7.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Demonstrate proficiency in the use of a variety of input/output devices, such as mouse/track pad, keyboard, microphone, digital camera, printer, scanner, disk/disc, modem, CD-ROM, projection device, or joystick.

b. Use digital keyboarding standards for data input such as spacing after punctuation and quotation marks.

c. Demonstrate the ability to select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency.

1. Choose the correct software (e.g., word processor, database, or spreadsheet) per task.
2. Create projects for different audiences (e.g., peers or community).

7.3.2. Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

a. Use productivity tools to create effective documents, such as slide shows, posters, multimedia presentations, newsletters, brochures, or reports, for defined audiences..

b. Demonstrate appropriate use of fonts, styles, and sizes, as well as effective use of graphics and page design to create a report or presentation.

Performance Indicators

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Sample Performance Task

- Students will design a slide-show presentation on a topic of their choice. The students will be assessed using a teacher designed rubric.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 4.0
Students will use technology communications tools.

Learning Expectations
4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments
7.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   a. Using multimedia authoring programs to create linear or non-linear projects incorporating text, audio, video, and/or graphics.
   b. Creating a document using desktop publishing techniques, including but not limited to the creation of multi-column or multi-section documents with a variety of text-wrapped frame formats.

7.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
   a. Planning, creating, and editing documents created with a word processor using readable fonts, alignment, page setup, tabs, and ruler settings.
   b. Creating and editing spreadsheet documents using all data types, formulas and functions, and chart information.

Performance Indicators

- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences.

Sample Performance Task

- Using Internet resources students will construct a timeline listing historical aspects of computing. The students should select the appropriate software to complete the task. The timeline describes early and modern methods of computing and identifies people involved in computing. Students compare and contrast generations of computers and project future technology trends. Students will print their projects and share results with the class.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

7.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.
   b. Use on-line help and other documentation.
   c. Evaluate the electronic information for accuracy and validity.
   d. Identify the source, location, relevancy, and content validity of available information.

7.5.2. Students will use technology tools to process data and report results.

a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.
b. Demonstrate knowledge of the advantages and disadvantages of using word processing to develop, publish and present information to a variety of audiences.

7.5.3. Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.

Performance Indicators

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.
- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.

Sample Performance Task

- Using a related curriculum topic, students will create collaboratively a multimedia (sound, pictures, and text) project utilizing library and classroom resources to access, analyze, interpret and synthesize information. During the time frame of project development students will take responsibility for copyrights of software and Internet resources. The teacher will use rubrics to evaluate this task including evidence of a variety of resources used to create original presentations concerning real-world problems.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 6.0

Students will utilize technology problem-solving and decision-making tools.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

7.6.1. Students will use technology resources for solving problems and making informed decisions.

a. Use technology in self-directed activities by sharing products for defined audiences.
   1. Create a document using a word processor to share with the class.
   2. Create presentations for extra-curricular activities (e.g., science fair, 4-H, or parent/teacher organizations).

b. Integrate acquired technology applications skills, strategies, and use of the word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs into the foundation and enrichment curricula.
   1. Compose essays or reports using a word processor.
   2. Create charts and graphs using a spreadsheet.

7.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

a. Demonstrate knowledge of the relevancy of technology to future job skills, life-long learning, and daily living.
   1. Discuss uses of technology at home.
   2. Compare technology of the past with the present.

b. Use technology resources (e.g., calculators, videos, educational software) for self-directed learning, problem solving and extended learning activities.
   1. Describes more than one problem-solving method.
   2. Selects an appropriate problem-solving method.
   3. Generate a desired outcome using a problem-solving method.

Performance Indicators

- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.

Sample Performance Task

- The student will develop a storyboard to establish a sequence for analyzing and performing a task. The teacher will use a rubric to evaluate flow chart construction and accuracy in relation to the storyboard.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

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COMPUTER TECHNOLOGY

EIGHTH GRADE

Standard 1.0
Students will understand basic operations and concepts of technology.

Learning Expectations

1.1 Students will demonstrate an understanding of the nature and operation of technology systems.
1.2 Students will exhibit a proficiency in the use of technology.
1.3 Students will demonstrate and apply basic skills (alpha numeric and special characters) in using keyboard using the touch system of keying

Accomplishments

8.1.1. Students will demonstrate an understanding of the nature and operation of technology systems.
   a. Demonstrate knowledge and appropriate use of operating systems, software applications, communication and networking components.
      1. Manipulate icons on the desktop, create folders, and store files within the folder.
      2. Use different software programs (word processor, spreadsheets, etc.).
      3. Maintain a current vocabulary of networking terms
   b. Use technology terminology appropriate to the task.
      1. Print reports based on a sort
      2. Print reports based on a query
   c. Use terminology related to the Internet appropriately including, but not limited to electronic mail (e-mail), Uniform Resource Locators (URLs), electronic bookmarks, local area networks (LANs), wide area networks (WANs), World Wide Web (WWW) page, and HyperText Markup Language (HTML).
   d. Explain how LANs, WANs, Internet, and intranet operate versus a stand-alone system.

8.1.2. Students will exhibit a proficiency in the use of technology.
   a. Compare, contrast, and appropriately use various input, processing, output, and primary/secondary storage devices.

1. Use peripheral devices, such as a mouse, a keyboard, and a scanner correctly.
2. Organize files on a computer disk, hard drive, server, or other storage device.

b. Perform basic software application functions including, but not limited to, opening an application program and creating, modifying, printing, and saving documents. (1.2) (M)
   1. Type, edit, and print a document.
   2. Create a chart that visually represents data.
   3. Import graphics with appropriate placement.
   4. Use advanced formatting techniques such as margins, line spacing, and tabs.
   5. Create a multi-page, multimedia presentation using text, graphics, and sound to effectively communicate a concept.

8.1.3. Students will develop basic skills (alpha numeric and special characters) in using keyboard using the touch system
   a. Using appropriate ergonomics, apply the touch system on the alpha, numeric, and symbol keys at a rate of 30 net words per minute (NMPM) on a 2 minute time straight copy timed writing..
   b. Apply the touch system to the numeric keypad

Performance Indicators

The student is able to:

- Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.
- Key at a rate of at least 30 net words per minute (NWPM) using the proper touch-keying techniques on a straight copy timed writing

Sample Performance Task

- Using a selected piece of software student will demonstrate that a computer needs instructions from system software to operate applications. Students model a teacher demonstration of sequential instructions to print, sort, calculate and perform other functions. The student will also explain that a computer uses binary codes to implement functions. Proficiency is determined by student utilization of software specific to the computer and the successful completion of assigned tasks as observed by the teacher.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations

2.1 Students will understand the ethical, cultural, and societal issues related to technology.
2.2 Students will practice responsible use of technology systems, information, and software.
2.3 Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Accomplishments

8.2.1. Students will understand the ethical, cultural, and societal issues related to technology.
- a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
  1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
  2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
  3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
- b. Discuss current changes in information technologies and how those changes affect society and the workplace.

8.2.2. Students will practice responsible use of technology systems, information, and software.
- a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.

1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.

8.2.3. Students will develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

a. Practices ethical and legal behaviors when using information and technology, and discuss ramifications of misuse.
   1. Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods.
   2. Demonstrate proper etiquette and knowledge of acceptable use while in an individual classroom, lab, or on the Internet and intranet.
   3. Describe the consequences regarding copyright violations including, but not limited to, computer hacking, computer piracy, intentional virus setting, and invasion of privacy.
   4. Demonstrate safe personal practices of the internet.
   5. Demonstrate appropriate use of electronic equipment.
b. Demonstrate knowledge of the relevancy of technology to future careers, lifelong learning, and daily living for individuals of all ages.
   1. Take a career assessment test and discuss results.
   2. Discuss the impact of technology on career options.
   3. Recognize that people control technologies and are responsible for their effects.

Performance Indicators
The student will be able to:

- Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.
- Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Sample Performance Task

- During appropriate curricular activities students will verbally describe when and how technology is used in everyday life and occupations. Using observation, teachers will develop a rubric evaluating the behavior of the students as they use technology in content area lessons.

Develop situational examples to test concepts of AYP and piracy.

Integration/Thematic Connections
See links on Tennessee State website @ _____.
Subjects such as Language Arts, Social Studies, and Science should apply citation of sources and piracy issues as they write and research from the Internet

Standard 3.0
Students will use technology productivity tools.

Learning Expectations

3.1 Students will use technology tools to enhance learning, increase productivity, and promote creativity.

3.2 Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Accomplishments

8.3.1. Students will use technology tools to enhance learning, increase productivity, and promote creativity.

a. Demonstrate proficiency in the use of a variety of input devices such as mouse/track pad, keyboard, microphone, digital camera, printer, scanner, disk/disc, modem, CD-ROM, or joystick.
b. Use digital keyboarding standards for data input such as spacing after punctuation and quotation marks.
c. Demonstrate the ability to select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency.
    1. Choose the correct software (e.g., word processor, database, or spreadsheet) per task.
    2. Create projects for different audiences (e.g., peers or community) .

8.3.2. Students will use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
   a. Use productivity tools to create effective document files for defined audiences such as slide shows, posters, multimedia presentations, newsletters, brochures, or reports.
   b. Demonstrate appropriate use of fonts, styles, and sizes, as well as effective use of graphics and page design to create a report or presentation.

Performance Indicators

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.

Sample Performance Task

- Students will design a slide-show presentation on a topic of their choice. The students will be assessed using a teacher designed rubric.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 4.0
Students will use technology communications tools.

Learning Expectations
4.1 Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2 Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Accomplishments

8.4.1. Students will use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences by:

a. Using multimedia authoring programs to create linear or non-linear projects incorporating text, audio, video, and/or graphics.
b. Creating a document using desktop publishing techniques including, but not limited to, the creation of multi-column or multi-section documents with a variety of text-wrapped frame formats.

8.4.2. Students will use a variety of media and formats to communicate information and ideas effectively to multiple audiences by:
a. Planning, creating, and editing documents created with a word processor using readable fonts, alignment, page setup, tabs, and ruler settings.
b. Creating and editing spreadsheet documents using all data types, formulas and functions, and chart information.

Performance Indicators

- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences.
- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences.

Sample Performance Task

- Using Internet resources students will construct a timeline listing historical aspects of computing. The students should select the appropriate software to complete the task. The timeline describes early and modern methods of computing and identifies people involved in computing. Students compare and contrast generations of computers and project future technology trends. Students will print their projects and share results with the class.

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students will use technology to locate, evaluate, and collect information from a variety of sources.

5.2 Students will use technology tools to process data and report results.
5.3 Students will evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Accomplishments

8.5.1. Students will use technology to locate, evaluate, and collect information from a variety of sources.
   a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.
   b. Use on-line help and other documentation.
   c. Evaluate the electronic information for accuracy and validity.
   d. Identify the source, location, relevancy, and content validity of available information

8.5.2. Students will use technology tools to process data and report results.
   a. Apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies.

Performance Indicators

- Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
- Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.
- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.

Sample Performance Task

- Using a related curriculum topic, students will create collaboratively a multimedia (sound, pictures, and text) project utilizing library and classroom resources to access, analyze, interpret and synthesize information. During the time frame of project development students will take responsibility for copyrights of software and Internet resources. The teacher will use rubrics to evaluate this task including evidence of a variety of resources used to create original presentations concerning real-world problems.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Integration/Thematic Connections
See links on Tennessee State website @ _____.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1 Students will use technology resources for solving problems and making informed decisions.

6.2 Students will employ technology in the development of strategies for solving problems in the real world.

Accomplishments

8.6.1. Students will use technology resources for solving problems and making informed decisions.

a. Use technology in self-directed activities by sharing products for defined audiences. (6.1) (M)
   1. Create a document using a word processor to share with the class.
   2. Create presentations for extra-curricular activities (e.g., science fair, 4-H, or parent/teacher organizations).

b. Integrate acquired technology applications skills, strategies, and use of the word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs into the foundation and enrichment curricula.
   1. Compose essays or reports using a word processor.
   2. Create charts and graphs using a spreadsheet.

8.6.2. Students will employ technology in the development of strategies for solving problems in the real world.

a. The student will demonstrate knowledge of the relevancy of technology to future job skills, life-long learning, and daily living.
   1. Discuss uses of technology at home.
   2. Compare technology of the past with the present.

b. Use technology resources (e.g., calculators, videos, educational software) for self-directed learning, problem-solving, and extended learning activities.
   1. Describes more than one problem-solving method.
   2. Selects an appropriate problem-solving method.
   3. Generate a desired outcome using a problem-solving method.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Performance Indicators

- Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.
- Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
- Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
- Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.
- Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Sample Performance Task

- The student will develop a storyboard to establish a sequence for analyzing and performing a task. The teacher will use a rubric to evaluate flow chart construction and accuracy in relation to the storyboard.

Integration/Thematic Connections

See links on Tennessee State website @ _____.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Computer Technology: Literacy and Usage: 9-12

Personal Computing

Course Description: This course is designed to improve student use and understanding of information age technology. Mastering the standards will enable students to learn about and effectively access and use technology resources. Students will use a variety of computer applications and tools and will explore the social, historical and ethical implications of using computer technology. It is expected that every student will demonstrate proficiency using these standards by the time the student completes high school. These standards can be met through this course or activities incorporated into other curriculum areas. (Alternatively, students may demonstrate mastery of these standards as a result of grades K-8 technology experiences.) The course is designed so that it may be taught with a minimum number of computers.

Prerequisites or Concurrent with: Keyboarding

Recommended Prerequisite or concurrent with: Word Processing Essentials

Grades: 9, 10,

Recommended Credit 1 Credit

Standard 1.0
Students will understand basic operations and concepts of technology.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Standard 3.0

Students will use technology productivity tools.

Standard 4.0
Students will use technology communications tools.

Standard 5.0
Students will select and use appropriate technology research tools.

Standard 6.0

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Students will utilize technology problem-solving and decision-making tools.

Computer Literacy and Usage: High School

COMPUTER LITERACY AND USAGE 9-12

Computer Literacy

(Formerly Personal Computing)

GRADES 9 - 12

Standard 1.0
Students will understand basic operations and concepts of technology

Learning Expectations
1.1. Students demonstrate a sound understanding of the nature and operation of technology systems.
1.2. Students are proficient in the use of technology.

Performance Indicators
Make informed choices among technology systems, resources, and services.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International.

Standard 2.0
Students will understand the importance of social, ethical, and human issues associated with technology.

Learning Expectations
2.1 Students understand the ethical, cultural, and societal issues related to technology.
2.2 Students practice responsible use of technology systems, information, and software.
2.3 Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Performance Indicators

- Identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs.
- Analyze advantages and disadvantages of widespread use and reliance on technology in the workplace and in society as a whole.
- Make informed choices among technology systems, resources, and services.
- Demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International.

Standard 3.0
Students will use technology productivity tools.

Learning Expectations

3.1 Students use technology tools to enhance learning, increase productivity, and promote creativity.
3.2 Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Performance Indicators

- Use technology tools and resources for managing and communicating personal/professional information (e.g., finances, schedules, addresses, purchases, correspondence).
- Investigate and apply expert systems, intelligent agents, and simulations in real-world situations

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International.

Standard 4.0
Students will use technology communications tools.

Learning Expectations

4.1 Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
4.2 Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

Performance Indicators

- Use technology tools and resources for managing and communicating personal/professional information (e.g., finances, schedules, addresses, purchases, correspondence).
- Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity.
- Select and apply technology tools for research, information analysis, problem solving, and decision making in content learning.
- Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International.

Standard 5.0
Students will select and use appropriate technology research tools.

Learning Expectations

5.1 Students use technology to locate, evaluate, and collect information from a variety of sources.
5.2 Students use technology tools to process data and report results.
5.3 Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

Performance Indicators

- Evaluate technology-based options, including distance and distributed education, for lifelong learning.
- Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity.
- Select and apply technology tools for research, information analysis, problem solving, and decision making in content learning.
- Investigate and apply expert systems, intelligent agents, and simulations in real-world situations.
- Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works.

Computer Technology Curriculum Standards
Section 1 – Literacy and Usage

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International.

Standard 6.0
Students will utilize technology problem-solving and decision-making tools.

Learning Expectations

6.1 Students use technology resources for solving problems and making informed decisions.
6.2 Students employ technology in the development of strategies for solving problems in the real world.

Performance Indicators

- Routinely and efficiently use online information resources to meet needs for collaboration, research, publication, communication, and productivity.
- Investigate and apply expert systems, intelligent agents, and simulations in real-world situations.
- Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association and International Association of Administrative Professionals Gateway Algebra I and Gateway English I

Computer Technology

Programming

Grades 9-12

BASIC PROGRAMMING APPLICATIONS

This course is designed to develop object-oriented programming language skills using Beginners All-Purpose Symbolic Instruction Code (*BASIC*). The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs.

Prerequisites: Keyboarding

Prerequisites or Concurrent with: Algebra I

Recommended Prerequisites or Concurrent with: Computer Applications, Word Processing Essentials, Career Connection

Grades: 9, 10, 11, 12

Recommended Credit: 1 Credit

Computer Technology Curriculum Standards
Section 2 Programming

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0).

Standard 4.0

The student will apply system operations in executing *BASIC* programs.

Standard 5.0

The student will write and document an executable program in *BASIC Programming Language*.

Standard 6.0

The student will work as a team member to develop an integrated application using *BASIC Programming Language*.

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program.

Standard 8.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

BASIC Programming Applications

Course Description:

This course is designed to develop object-oriented programming language skills using Beginners All-Purpose Symbolic Instruction Code (*BASIC*). The student will utilize the commands, statements, and procedures of this language to develop computer programs. *(This course requires a computerized workstation for each student with appropriate text editing and compiler software and tools provided.)*

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Learning Expectations

The student will:

1.1 Discuss the history of computers and programming languages.
1.2 Discuss the components of the computer.
1.3 Summarize the characteristics of the *BASIC Programming Language*.
1.4 Critique the role of computer programming in society.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Summarizes the history of computers and programming languages.
- Explains the purposes of the *BASIC Programming Language*.
- Examines the role of computer programming in society.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be evaluated by the given dates and the content area covered on the timeline.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standard 1.0, 3.0, English II Standard 3.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Learning Expectations

The student will:

2.1 Demonstrate work ethics that include integrity, honesty, and perseverance to be accepted by industry.
2.2 Research benefits and consequences resulting from the practice of business ethics.
2.3 Comprehend copyright laws and their applications to text, visual art, design, and photography.
2.4 Research legal responsibilities associated with the use of the Internet as required by federal and state government agencies.

Performance Standards: Evidence Standard is Met

The student:

- Applies ethical conduct providing the proper credit to those whose ideas and content has been used in creating new works.
- Demonstrates ethical behaviors in what is written, spoken, or presented in designing and presenting a multimedia project.
- Applies knowledge of copyrights in seeking formal permission from copyright sources before using materials.
- Recognizes the legal implications of violating federal and state laws in multimedia\digital publishing.
- Demonstrates legal responsibilities using the Internet for interactive multimedia projects.
- Demonstrate skills necessary for safety and environmental protection in digital design and photography.

Computer Technology Curriculum Standards
Section 2 Programming

Sample Performance Task

Design and produce an interactive multimedia project on legal and ethical issues that includes: issues and penalties for plagiarism, obligations and procedures related to obtaining permission in copying materials. Provide attribution, determine the need for requesting permission to reproduce materials, and obtain formal permission for use of materials where needed (quotations, art form, design, photo, text from a book, text from the Web…). Develop and present a total team interactive multimedia project utilizing various technology components.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), and International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II, English IV: Communication for Life

Computer Technology Curriculum Standards
Section 2 Programming

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0).

Learning Expectations:

The student will

3.1 Create a storyboard.
3.2 Illustrate a process using a flowchart.
3.3 Demonstrate the use of Pseudocode.
3.4 Develop a detailed logic plan.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Diagrams a sequence of steps using program development tools.

Sample Performance Task

The student will produce a detailed logic plan using the programming development tools.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 4.0

The student will apply system operations in executing *BASIC* programs.

Learning Expectations

The student will:

4.1 Demonstrate computer start-up and shut-down procedures.
4.2 Discuss the execution of programs.
4.3 Explain the storage, retrieval, and deletion of programs.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Demonstrate the use of an existing *BASIC* program on the computer.

Sample Performance Task

The student will demonstrate start-up and execution of an existing program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 5.0

The student will write and document an executable program in *BASIC Programming Language*.

Learning Expectations

The student will:

5.1 Identify names for variables and their data types.
5.2 Recognize and apply the symbols for mathematical operations.
5.3 Demonstrate the various methods of obtaining input/output and formatting output.
5.4 Analyze the task and implement a detailed logic plan.
5.5 Demonstrate the use of control statements.
5.6 Identify, illustrate, and perform operations using arrays.
5.7 Identify and apply virtual functions and polymorphism.
5.8 Read and/or write data files for input/output purposes.
5.9 Debug the program and verify the output of the program.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Given a task, develop a detailed logic plan that uses appropriate input/output methods, variables, symbols, and appropriate uses.
- Writes a *BASIC* executable program using control statements, arrays, and functions.
- Writes input/output data files.
- Troubleshoots a *BASIC* program.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successful operation of the program.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standards 1.0, 2.0, 3.0, 4.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 6.0

The student will work as a team member to develop integrated application using *BASIC Programming Language*.

Learning Expectations

The student team will:

6.1 Define the roles of each team members.
6.2 Solve a complex task using *BASIC Programming Language*.
6.3 Compare and contrast the advantages of working as a group.

Student Performance Indicator: Evidence Standard Is Met

The team:

- Work as a member of team to solve a complex task using *BASIC Programming Language* and presents the solution of the task.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program.

Learning Expectations

The student will:

7.1 Analyze composition processes.
7.2 Illustrate how to apply typographical commands to text.
7.3 Evaluate the effectiveness of typography in publications.
7.4 Compare and contrast the typography from at least two print sources.

Performance Standards: Evidence Standard is Met

The student:

- Applies composition techniques.
- Analyzes different typestyles.
- Differentiates among the different types of justification.
- Prepares a layout using typesetting specifications.

Sample Performance Task

Have students illustrate at least three font technologies. Using different backgrounds compare and contrast the typography of each.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), and International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 2 Programming

Standard 8.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

Learning Expectations

The student will:

8.1 Demonstrate self-initiative through group projects.
8.2 Examine the value of leadership skills.
8.3 Illustrate image building and public relations techniques.
8.4 Assess decision-making skills.
8.5 Demonstrate effective teamwork and group thinking applying conflict resolution techniques.
8.6 Demonstrate parliamentary procedure skills through group activities.
8.7 Demonstrate teamwork skill in developing a program *in BASIC program* for a specific problem.
8.8 Analyze the goals and apply the principles of a co-curricular student organization.

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches, analyzes, composes, keys, formats, and prints the attributes of a leader.
- Applies effective image-building and public relations techniques.
- Designs, writes, runs, debugs, and edits a *BASIC* program to manage the financial data for the local chapter.
- Organizes and manages a team presentation on leadership.
- Practices proper parliamentary procedure skills through group activities.
- Makes a two-minute report on attributes of a leader.
- **Designs, writes, runs, debugs, and edit a *BASIC* program to manage the financial data for the local chapter.**
- Participates in a mock Computer Science, Business Professionals of America and/or Future Business Leaders of America organizational meeting.

Computer Technology Curriculum Standards
Section 2 Programming

Sample Performance Task

Divide the students into groups. Each group will write, run, debug, and edit a program to electronically keep the financial records of a student organization such as the Computer Science, Business Professionals of America and/or Future Business Leaders of America organization. The program should include a general ledger, with sort and print capabilities to produce a balance sheet, income and expense statements. Remind each group member of his or her responsibilities and role as a group member.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association and International Association of Administrative Professionals Gateway Algebra I and Gateway English II.

C++ PROGRAMMING APPLICATIONS

This course is designed to develop object-oriented programming language skills using C++. The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs.

Prerequisites: Keyboarding

Prerequisites or Concurrent with: Algebra I

Recommended Prerequisites or Concurrent with: Computer Applications, Word Processing Essentials, Career Connection

Grades: 9, 10, 11, 12

Recommended Credit: 1 Credit

Computer Technology Curriculum Standards
Section 2 Programming

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0).

Standard 4.0

The student will apply system operations in executing C++ programs.

Standard 5.0

The student will write and document an executable program in C++ Programming Language.

Standard 6.0*

The student will work as a team member to develop an integrated application using C++ Programming Language.

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program.

Standard 8.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

Computer Technology Curriculum Standards
Section 2 Programming

Course Description:

This course is designed to develop object-oriented programming language skills using C++. The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs. (This course requires a computerized workstation for each student with appropriate text editing and compiler software and tools provided.)

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Learning Expectations

The student will:

1.1 Discuss the history of computers and programming languages.
1.2 Discuss the components of the computer.
1.3 Summarize the characteristics of the C++ Programming Language.
1.4 Critique the role of computer programming in society.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Summarizes the history of computers and programming languages.
- Explains the purposes of the C++ Programming Language.
- Examines the role of computer programming in society.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be evaluated by the given dates and the content area covered on the timeline.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standards 1.0, 3.0, English II Standard 3.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Learning Expectations

The student will:

2.1 Demonstrate work ethics that include integrity, honesty, and perseverance to be accepted by industry.
2.2 Research benefits and consequences resulting from the practice of business ethics.
2.3 Comprehend copyright laws and their applications to text, visual art, design, and photography.
2.4 Research legal responsibilities associated with the use of the Internet as required by federal and state government agencies.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Applies ethical conduct providing the proper credit to those whose ideas and content has been used in creating new works.
- Demonstrates ethical behaviors in what is written, spoken, or presented in designing and presenting a multimedia project.
- Applies knowledge of copyrights in seeking formal permission from copyright sources before using materials.
- Recognizes the legal implications of violating federal and state laws in multimedia/digital publishing.
- Demonstrates legal responsibilities using the Internet for interactive multimedia projects.
- Demonstrate skills necessary for safety and environmental protection in digital design and photography.

Sample Performance Task

Design and produce an interactive multimedia project on legal and ethical issues that includes: issues and penalties for plagiarism, obligations, and procedures related to obtaining permission in copying materials. Provide attribution, determine the need for requesting permission to reproduce materials and obtain formal permission for use of materials where needed (quotations, art form, design, photo, text from a book, text from the Web…). Develop and present a total team interactive multimedia project utilizing various technology components.

Integration/Linkages

Computer Technology Curriculum Standards
Section 2 Programming

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II, English IV: Communication for Life

Computer Technology Curriculum Standards
Section 2 Programming

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0).

Learning Expectations:

The student will:

3.1 Create a storyboard.
3.2 Illustrate a process using a flowchart.
3.3 Demonstrate the use of Pseudocode.
3.4 Develop a detailed logic plan.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Diagrams a sequence of steps using program development tools.

Sample Performance Task

The student will produce a detailed logic plan using the programming development tools.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 4.0

The student will apply system operations in executing C++ programs.

Learning Expectations

The student will:

4.1 Demonstrate computer start-up and shut-down procedures.
4.2 Discuss the execution of programs.
4.3 Explain the storage, retrieval, and deletion of programs.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Demonstrates the use of an existing C++ program on the computer.

Sample Performance Task

The student will demonstrate start-up and execution of an existing program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 5.0

The student will write and document an executable program in C++ Programming Language.

Learning Expectations

The student will:

5.1 Identify names for variables and their data types.
5.2 Recognize and apply the symbols for mathematical operations.
5.3 Demonstrate the various methods of obtaining input/output and formatting output.
5.4 Analyze the task and implement a detailed logic plan.
5.5 Demonstrate the use of control statements.
5.6 Identify, illustrate, and perform operations using arrays.
5.7 Identify and apply virtual functions and polymorphism.
5.8 Read and/or write data files for input/output purposes.
5.9 Debug the program and verify the output of the program.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Given a task, develop a detailed logic plan that uses appropriate input/output methods, variables, symbols, and appropriate uses.
- Writes a C++ executable program using control statements, arrays, and functions.
- Writes input/output data files.
- Troubleshoots a C++ program.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successful operation of the program.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standards 1.0, 2.0, 3.0, 4.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 6.0

The student will work as a team member to develop integrated application using C++ Programming Language.

Learning Expectations

The student team will:

6.1 Define the roles of each team members.
6.2 Solve a complex task using C++ Programming Language.
6.3 Compare and contrast the advantages of working as a group.

Student Performance Indicator: Evidence Standard Is Met

The team:

- Work as a member of team to solve a complex task using C++ Programming Language and presents the solution of the task.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program.

Learning Expectations

The student will:

7.1 Analyze composition processes.
7.2 Illustrate how to apply typographical commands to text.
7.3 Evaluate the effectiveness of typography in publications.
7.4 Compare and contrast the typography from at least two print sources.

Performance Standards: Evidence Standard is Met

The student:

- Applies composition techniques.
- Analyzes different typestyles.
- Differentiates among the different types of justification.
- Prepares a layout using typesetting specifications.

Sample Performance Task

Have students illustrate at least three font technologies. Using different backgrounds compare and contrast the typography of each.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, Gateway English II

Computer Technology Curriculum Standards
Section 2 Programming

Standard 8.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

Learning Expectations

The student will:

8.1 Demonstrate self-initiative through group projects.
8.2 Examine the value of leadership skills.
8.3 Illustrate image building and public relations techniques.
8.4 Assess decision-making skills.
8.5 Demonstrate effective teamwork and group thinking applying conflict resolution techniques.
8.6 Demonstrate parliamentary procedure skills through group activities.
8.7 Demonstrate teamwork skill in developing a C++ program for a specific problem.
8.8 Analyze the goals and apply the principles of a co-curricular student organization.

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches, analyzes, composes, keys, formats and prints the attributes of a leader.
- Applies effective image-building and public relations techniques.
- Designs, writes, runs, debugs, and edits a C++ program to manage chapter activities.
- Organizes and manages a team presentation on leadership.
- Practices proper parliamentary procedure skills through group activities.
- Makes a two-minute report on attributes of a leader.
- Participates in a mock Computer Science, Business Professionals of America and/or Future Business Leaders of America organizational meeting.

Computer Technology Curriculum Standards
Section 2 Programming

Sample Performance Task

Divide the students into groups. Each group will write, run, debug, and edit a program to electronically keep the objectives, financial information, and attendee list for an individual activity for the Computer Science, Business Professionals of America and/or Future Business Leaders of America organization. Each group should develop a different program for each activity such as a community service project, a fundraiser for the scholarship fund, etc. The program should include a general ledger, with sort and print capabilities to produce a balance sheet, income, and expense statements. Remind each group member of his or her responsibilities and role as a group member.

Integration/Linkages

All subject areas, SCANS (The Secretary's Commission on Achieving Necessary Skills), National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America Work Place Skills, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II.

JAVA PROGRAMMING APPLICATIONS

This course is designed to develop object-oriented programming language skills using *JAVA*. The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs.

Prerequisites: Keyboarding

Prerequisites or Concurrent with: Algebra I

Recommended Prerequisites or Concurrent with: Computer Applications**,** Word Processing Essentials, Career Connection

Grades: 9, 10, 11, 12

Recommended Credit: 1 Credit

Computer Technology Curriculum Standards
Section 2 Programming

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0)

Standard 4.0

The student will apply system operations in executing *JAVA* programs.

Standard 5.0

The student will write and document an executable program in *JAVA Programming Language*.

Standard 6.0

The student will work as a team member to develop an integrated application using *JAVA Programming Language*.

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program.

Standard 8.0

The student will demonstrate organizational and professional leadership skills.

Computer Technology Curriculum Standards
Section 2 Programming

Course Description:

This course is designed to develop object-oriented programming language skills using *JAVA.* The student will utilize the commands, statements, and procedures of this language to write, run, debug, and edit computer programs. *(This course requires a computerized workstation for each student with appropriate text editing and compiler software and tools provided.)*

Standard 1.0

The student will demonstrate proficiency in the background knowledge of computers and programming.

Learning Expectations

The student will:

1.1 Discuss the history of computers and programming languages.
1.2 Discuss the components of the computer.
1.3 Summarize the characteristics of the *JAVA* programming language.
1.4 Critique the role of computer programming in society.
1.5 Discuss the use of JAVA on the web.
1.6 Distinguish between a JAVA application and a JAVA applet.
1.7 Discuss the concept of Object Oriented Programming.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Summarizes the history of computers and programming languages.
- Explains the difference between an application and an applet.
- Explains the purposes of the *JAVA Programming Language*.
- Examines the role of computer programming in society.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be evaluated by the given dates and the content area covered on the timeline.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standards 1.0, 3.0, English II Standard 3.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Learning Expectations

The student will:

2.1 Demonstrate work ethics that include integrity, honesty, and perseverance to be accepted by industry.
2.2 Research benefits and consequences resulting from the practice of business ethics.
2.3 Comprehend copyright laws and their applications to text, visual art, design, and photography.
2.4 Research legal responsibilities associated with the use of the Internet as required by federal and state government agencies.

Performance Standards: Evidence Standard is Met

The student:

- Applies ethical conduct providing the proper credit to those whose ideas and content has been used in creating new works.
- Demonstrates ethical behaviors in what is written, spoken, or presented in designing and presenting a multimedia project.
- Applies knowledge of copyrights in seeking formal permission from copyright sources before using materials.
- Recognizes the legal implications of violating federal and state laws in multimedia\digital publishing.
- Demonstrates legal responsibilities using the Internet for interactive multimedia projects.
- Demonstrate skills necessary for safety and environmental protection in digital design and photography.

Computer Technology Curriculum Standards
Section 2 Programming

Sample Performance Task

Design and produce an interactive multimedia project on legal and ethical issues that includes: issues and penalties for plagiarism, obligations, and procedures related to obtaining permission in copying materials. Provide attribution, determine the need for requesting permission to reproduce materials and obtain formal permission for use of materials where needed (quotations, art form, design, photo, text from a book, text from the Web…). Develop and present a total team interactive multimedia project utilizing various technology components.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), and International Association of Administrative Professionals (IAAP), Gateway Algebra I and Gateway English II, English IV: Communication for Life

Computer Technology Curriculum Standards
Section 2 Programming

Standard 3.0

The students will use Program Development Tools as they relate to the programming development cycle. (Alg I 1.0, 3.0, 5.0)

Learning Expectations:

The student will:

3.1 Create a storyboard.
3.2 Illustrate a process using a flowchart.
3.3 Demonstrate the use of Pseudocode.
3.4 Develop a detailed logic plan.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Diagrams a sequence of steps using program development tools.

Sample Performance Task(s)

The student will produce a detailed logic plan using the programming development tools.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 4.0

The student will apply system operations in executing *JAVA* programs.

Learning Expectations

The student will:

4.1 Demonstrate computer start-up and shut-down procedures.
4.2 Discuss the execution of programs.
4.3 Explain the storage, retrieval and deletion of programs.
4.4 Install and use a JAVA compiler.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Demonstrate the use of an existing *JAVA* program on the computer.
- Use a JAVA compiler.

Sample Performance Task(s)

The student will demonstrate start-up and execution of an existing program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

Algebra I Standards 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 5.0

The student will write and document an executable program in *JAVA Programming Language*.

Learning Expectations

The student will:

5.1 Identify names for variables and their data types.
5.2 Recognize and apply the symbols for mathematical operations.
5.3 Demonstrate the various methods of obtaining input/output and formatting output.
5.4 Analyze the task and implement a detailed logic plan.
5.5 Demonstrate the use of control statements.
5.6 Identify, illustrate and perform operations using arrays.
5.7 Identify and apply virtual functions and polymorphism.
5.8 Read and/or write data files for input/output purposes.
5.9 Debug the program and verify the output of the program.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Analyze, design, and write executable *JAVA* program.
- Given a task, develop a detailed logic plan that uses appropriate input/output methods, variables, symbols, and appropriate uses.
- Writes a *JAVA* executable program using control statements, arrays, and functions.
- Writes input/output data files.
- Troubleshoots a *JAVA* program.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successful operation of the program.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

Algebra I Standards 1.0, 2.0, 3.0, 4.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 6.0

The student will work as a team member to develop integrated application using *JAVA*.

Learning Expectations

The team will:

6.1 Define the roles of each team members.
6.2 Solve a complex task using *JAVA*.
6.3 Compare and contrast the advantages of working as a group.

Student Performance Indicator: Evidence Standard Is Met

The team:

- Work as a member of team to solve a complex task using *JAVA Programming Language* and presents the solution of the task.

Integration/Linkages

Algebra I Standard 1.0, 3.0, 5.0, English II Standards 1.0, 2.0, 3.0, 4.0, All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association, Policies Commission for Business and Economic Education

Computer Technology Curriculum Standards
Section 2 Programming

Standard 7.0

The student will apply concepts and guidelines for typography, design, layout, and composition in developing a computer program

Learning Expectations

The student will:

7.1 Analyze composition processes.
7.2 Illustrate how to apply typographical commands to text.
7.3 Evaluate the effectiveness of typography in publications.
7.4 Compare and contrast the typography from at least two print sources.

Performance Standards: Evidence Standard is Met

The student:

- Applies composition techniques.
- Analyzes different typestyles.
- Differentiates among the different types of justification.
- Prepares a layout using typesetting specifications.

Sample Performance Task

Have students illustrate at least three font technologies. Using different backgrounds compare and contrast the typography of each.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 2 Programming

Standard 8.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

Learning Expectations

The student will:

8.1 Demonstrate self-initiative through group projects.
8.2 Examine the value of leadership skills.
8.3 Illustrate image building and public relations techniques.
8.4 Assess decision-making skills.
8.5 Demonstrate effective teamwork and group thinking applying conflict resolution techniques.
8.6 Demonstrate parliamentary procedure skills through group activities.
8.7 Demonstrate teamwork skill in developing a *JAVA* program for a specific problem.
8.8 Analyze the goals and apply the principles of a co-curricular student organization.

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches, analyzes, composes, keys, formats, and prints the attributes of a leader.
- Applies effective image-building and public relations techniques.
- Designs, writes, runs, debugs, and edits a *JAVA* program to manage the financial data for the local chapter.
- Organizes and manages a team presentation on leadership.
- Practices proper parliamentary procedure skills through group activities.
- Makes a two-minute report on attributes of a leader.
- Participates in a mock Computer Science, Business Professionals of America and/or Future Business Leaders of America organizational meeting.

Computer Technology Curriculum Standards
Section 2 Programming

Sample Performance Task

Divide the students into groups. Each group will write, run, debug, and edit a program to electronically keep the financial records of a student organization such as the Computer Science, Business Professionals of America and/or Future Business Leaders of America organization. The program should include a general ledger, with sort and print capabilities to produce a balance sheet, income and expense statements. Remind each group member of his or her responsibilities and role as a group member.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals Gateway Algebra I, and Gateway English II.

Computer Technology Curriculum Standards
Section 2 Programming

COMPUTER TECHNOLOGY: Programming
Grades 9-12

FORTRAN

This course is written for one unit of credit. Standards and Learning Expectations indicated by an asterisk () may be excluded for one-half unit of credit.

Course Description: This course is designed to give the student an introduction to FORTRAN programming. The student will utilize the commands, statements, and procedures of this language to develop computer programs.

Standard

1. The student will gain competency in the background knowledge of computers and programming.

   Learning Expectations
   The student will
   1. Discuss the history of computers and programming languages.
   2. Describe the purposes of the computer and the FORTRAN language.
   3. Discuss the architecture of the computer.
   4. Summarize the characteristics of the FORTRAN programming language.
   5. Critique the role of the computer in society.

Performance Indicators: Evidence Standard Is Met

The student is able to

- summarize the history of computers and programming languages.
- explain the use of the FORTRAN language.
- discuss the structure of the FORTRAN programming language.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be designated by the given dates and the content area covered on the timeline.

Integration/Linkages

Computer Technology Curriculum Standards
Section 2 Programming

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

2. The student will use system operations as they relate to FORTRAN programs on the computer.

   Learning Expectations
   The student will
   1. Demonstrate computer start-up procedures.
   2. Discuss the basic structure of the FORTRAN language.
   3. Explain FORTRAN program entry, listing and editing as it relates to the operating system.
   4. Discuss the execution of programs.
   5. Explain the storage, retrieval and deletion of programs.

Performance Indicators: Evidence Standard Is Met

The student is able to

- demonstrate the use of a prepared FORTRAN program on the computer.

Sample Performance Task(s)

The student will demonstrate entry of and execution of a prepared program. In addition the student will retrieve the program, edit and execute the edited program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

3. The student will write and document an executable program in FORTRAN

   Learning Expectations
   The student will
   1. Identify names for variables and their data types.

2. Recognize the symbols for operations and use them in evaluating data.
3. Demonstrate the various methods of obtaining input/output and formatting output.
4. Analyze the task and develop an algorithm.
5. Demonstrate control statements.
6. Identify, illustrate and perform operations on data types in arrays.
7. Identify and use functions.
8. Read and/or write data files for input/output purposes.
9. Debug the program and verify the output of the program.

Performance Indicators: Evidence Standard Is Met

The student is able to

- analyze, design and write a minimum of two executable programs in FORTRAN for each of the Learning Expectations.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successfull operation of the program.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

4. The student will work as a team member to develop an integrated application using FORTRAN.

   Learning Expectations
   The student will
   1. Define the roles of the team members.
   2. Solve a complex task using FORTRAN.
   3. Compare and contrast the advantages of working as a group.

Performance Indicators: Evidence Standard Is Met

The team is able to

- analyze and present the solution of the task.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Computer Technology Curriculum Standards
Section 2 Programming

COMPUTER TECHNOLOGY: Programming
Grades 9-12

C

This course is written for one unit of credit. Standards and Learning Expectations indicated by an asterisk (*) may be excluded for one-half unit of credit.

Course Description: This course is designed to give the student an introduction to C programming. The student will utilize the commands, statements, and procedures of this language to develop computer programs.

Standard

1. The student will gain competency in the background knowledge of computers and programming.

Learning Expectations
The student will

1. Discuss the history of computers and programming languages.
2. Describe the purposes of the computer and the C language.
3. Discuss the architecture of the computer.
4. Summarize the characteristics of the C programming language.
5. Critique the role of the computer in society.

Performance Indicators: Evidence Standard Is Met

The student is able to

- summarize the history of computers and programming languages.
- explain the use of the C language.
- discuss the structure of the C programming language.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be designated by the given dates and the content area covered on the timeline.

Integration/Linkages

Computer Technology Curriculum Standards
Section 2 Programming

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

2. The student will use system operations as they relate to C programs on the computer.

Learning Expectations
The student will

1. Demonstrate computer start-up procedures.
2. Discuss the basic structure of the C language.
3. Explain C program entry, listing and editing as it relates to the operating system.
4. Discuss the execution of programs.
5. Explain the storage, retrieval and deletion of programs.

Performance Indicators: Evidence Standard Is Met

The student is able to

- demonstrate the use of a prepared C program on the computer.

Sample Performance Task(s)

The student will demonstrate entry of and execution of a prepared program. In addition the student will retrieve the program, edit and execute the edited program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

3. The student will write and document an executable program in C

Learning Expectations
The student will

1. Identify names for variables and their data types.

2. Recognize the symbols for operations and use them in evaluating data.
3. Demonstrate the various methods of obtaining input/output and formatting output.
4. Analyze the task and develop an algorithm.
5. Demonstrate control statements.
6. Identify, illustrate and perform operations on data types in arrays.
7. Identify and use functions.
8. Read and/or write data files for input/output purposes.
9. Debug the program and verify the output of the program.

Performance Indicators: Evidence Standard Is Met

The student is able to

- analyze, design and write a minimum of two executable programs in C for each of the Learning Expectations.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successfull operation of the program.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

4. The student will work as a team member to develop an integrated application using C .

Learning Expectations
The student will

1. Define the roles of the team members.
2. Solve a complex task using C .
3. Compare and contrast the advantages of working as a group.

Performance Indicators: Evidence Standard Is Met

The team is able to

- analyze and present the solution of the task.

Computer Technology Curriculum Standards
Section 2 Programming

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Computer Technology Curriculum Standards
Section 2 Programming

COMPUTER TECHNOLOGY: Programming
Grades 9-12

Pascal

This course is written for one unit of credit. Standards and Learning Expectations indicated by an asterisk (*) may be excluded for one-half unit of credit.

Course Description: This course is designed to give the student an introduction to Pascal programming. The student will utilize the commands, statements, and procedures of this language to develop computer programs.

Standard

1. The student will gain competency in the background knowledge of computers and programming.

   Learning Expectations The student will
   1. Discuss the history of computers and programming languages.
   2. Describe the purposes of the computer and the Pascal language.
   3. Discuss the architecture of the computer.
   4. Summarize the characteristics of the Pascal programming language.
   5. Critique the role of the computer in society.

Performance Indicators: Evidence Standard Is Met

The student is able to

- summarize the history of computers and programming languages.
- explain the use of the Pascal language.
- discuss the structure of the Pascal programming language.

Sample Performance Task

The student will develop a timeline for the history of computers and programming languages. Proficiency would be designated by the given dates and the content area covered on the timeline.

Integration/Linkages

Computer Technology Curriculum Standards
Section 2 Programming

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

2. The student will use system operations as they relate to Pascal programs on the computer.

   Learning Expectations
   The student will
   1. Demonstrate computer start-up procedures.
   2. Discuss the basic structure of the Pascal language.
   3. Explain Pascal program entry, listing and editing as it relates to the operating system.
   4. Discuss the execution of programs.
   5. Explain the storage, retrieval and deletion of programs.

Performance Indicators: Evidence Standard Is Met

The student is able to

- demonstrate the use of a prepared Pascal program on the computer.

Sample Performance Task(s)

The student will demonstrate entry of and execution of a prepared program. In addition the student will retrieve the program, edit and execute the edited program. Evaluation is determined by the successful execution of the programs.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

3. The student will write and document an executable program in Pascal

   Learning Expectations
   The student will
   1. Identify names for variables and their data types.

2. Recognize the symbols for operations and use them in evaluating data.
3. Demonstrate the various methods of obtaining input/output and formatting output.
4. Analyze the task and develop an algorithm.
5. Demonstrate control statements.
6. * Identify, illustrate and perform operations on data types in arrays.
7. * Identify and use functions.
8. * Read and/or write data files for input/output purposes.
9. Debug the program and verify the output of the program.

Performance Indicators: Evidence Standard Is Met

The student is able to

- analyze, design and write a minimum of two executable programs in Pascal for each of the Learning Expectations.

Sample Performance Task

Each student will write a program that converts data from one unit of measurement to another unit of measurement. Evaluation will be the successfull operation of the program.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

Standard

4. * The student will work as a team member to develop an integrated application using Pascal.

Learning Expectations
The student will
1. * Define the roles of the team members.
2. * Solve a complex task using Pascal.
3. * Compare and contrast the advantages of working as a group.

Performance Indicators: Evidence Standard Is Met

The team is able to

- * analyze and present the solution of the task.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, National Science Education Standards, National Math Standards, National Educational Technology Standards (NETS), Data Processing Management Association

AP COMPUTER SCIENCE

Uses the College Board Standards

Computer Applications

This course is designed to develop computer technology skills. Students will use a variety of computer software and hardware tools and features of an electronic information network. Students will explore the, historical, social and ethical issues of using computer technology. The students will develop skills that will assist them with efficient production; accurate production analysis; management of information and design and presentation of a multimedia project.

Prerequisites or Concurrent with: Keyboarding

Recommended Prerequisite or concurrent with: Word Processing Essentials

Grades: 9, 10,

Recommended Credit 1 Credit

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 1.0

The student will evaluate the impact and applications of computers in society.

Standard 2.0

The student will apply skills appropriate to the resident operating system.

Standard 3.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Standard 4.0

The student will research and apply typography, layout, design, and composition concepts and guidelines for preparation of documents.

Standard 5.0

The student will accurately create a variety of word processing documents.

Standard 6.0

The student will create and design spreadsheets to produce and manipulate alpha/numeric data.

Standard 7.0

The student will develop database skills to organize and maintain information.

Standard 8.0

The student will design a multimedia presentation.

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 9.0

The student will examine the new and emerging technologies.

Standard 10.0

The student will examine network, hardware, software, and programming applications.

Standard 11.0

The student will develop and demonstrate human relations, self-management, organizational and professional leadership skills.

Computer Technology Curriculum Standards
Section 3 Research and Development

Course Description:

This course is designed to develop computer technology skills. Students will use a variety of computer software and hardware tools and features of an electronic information network. Students will explore the, historical, social and ethical issues of using computer technology. The students will develop skills that will assist them with efficient production; accurate production analysis; management of information; and design and presentation of a multimedia project. *(This course requires a computerized workstation for each student with operating system, word processing, database, spreadsheet presentation, networking resident software.)*

Standard 1.0

The student will evaluate the impact and applications of computers in society.

Learning Expectations

The student will:

1.1 Analyze the impact of computer technology on individual lives and the business world. (Gateway English II 3.0)
1.2 Explore emerging computer technologies. (Gateway English II 2.0, 3.0)
1.3 Analyze different types of computer applications and the types of tools needed to complete each. (Gateway English II 3.0)
1.4 Explore the use of computers in business, recreation, and entertainment. (Gateway English II 2.0, 3.0)

Computer Technology Curriculum Standards
Section 3 Research and Development

Student Performance Indicator: Evidence Standard Is Met

The student:

- Compares and contrasts the benefits and limitations of computer technology in business, education, recreation, and entertainment.
- Examines and reports on current trends through the use of videos, Internet, magazines, newspapers, etc.

Sample Performance Task

In assigned work groups, research and identify ways technology affects each team member.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 2.0

The student will apply skills appropriate to the resident operating system.

The student will:

2.1 Operate the keyboard by using the touch system.
2.2 Apply the touch system to develop basic keyboarding skills on the alphabetic, numeric, and special characters on the keyboard.
2.3 Analyze and illustrate use of operating system commands. (Gateway English II 2.0, 3.0)
2.4 Analyze components and functions of the operating system. (Gateway English II 2.0, 3.0)
2.5 Demonstrate operating system commands.
2.6 Demonstrate proficiency in the care and operation of computer technology.

Student Performance Indicator: Evidence Standard Is Met

The student:

- Applies correct body and hand position for keyboarding.
- Uses the proper technique system to reach the alphabetic, numeric and special characters keys.
- Demonstrates the features of the operating system
- Utilizes the operating system environment to:
  - Analyze the types of files shown in a directory.
  - Create directories (folders) and sub directories.
  - Rename existing files and directories (folders).
  - Save or move files to a variety of storage media.

Sample Performance Task

- Use a technique check sheet to evaluate proper technique at the keyboard.
- The student will use components and functions of the resident operating system.

Computer Technology Curriculum Standards
Section 3 Research and Development

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 3.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Learning Expectations

The student will:

3.1 Demonstrate work ethics that include integrity, honesty, and perseverance that meet industry standards.
3.2 Research benefits and consequences resulting from the practice of business ethics. (Gateway English II 2.0)
3.3 Observes copyright laws and their applications to text, visual art, design, music, and photography. (Gateway English II 2.0)
3.4 Research legal responsibilities associated with the use of the Internet as required by federal and state government agencies. (Gateway English II 2.0, 3.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Applies ethical conduct providing the proper credit to those whose ideas and content has been used in creating interactive multimedia projects.
- Demonstrates ethical behaviors in what is written, spoken, or presented in designing and presenting a multimedia project.
- Applies knowledge of copyrights in seeking formal permission from copyright sources before using materials.
- Recognizes the legal implications of violating federal and state laws in multimedia/digital publishing.
- Demonstrates legal responsibilities using the Internet for interactive multimedia projects.
- Demonstrate skills necessary for safety and environmental protection in digital design and photography.
- Develop a virtual presentation on ethical and legal issues that could be posted on the Web.

Sample Performance Task

Design and produce an interactive multimedia project on legal and ethical issues, including issues and penalties for plagiarism; the importance of attribution; the determination of need to receive permission to copy data; and the process for obtaining permission. Provide attribution and obtain formal permission, when needed, for use of quotations, art forms, designs, music, and photographs. Develop and present a total team interactive multimedia project utilizing various

technology components**.**

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 4.0

The student will research and apply typography, layout, design, and composition concepts and guidelines for preparation of documents.

Learning Expectations

The student will:

4.1 Analyze composition processes. (Gateway English II 1.0, 2.0, 3.0, 4.0)
4.2 Analyze principles of typography. (Gateway English II 1.0, 2.0, 3.0)
4.3 Illustrate how to apply typographical commands to text.
4.4 Evaluate the effectiveness of typography in publications. (Gateway English II 1.0, 2.0, 4.0)
4.5 Compare and contrast the typography from at least two print sources: (Gateway English II 1.0, 2.0, 3.0, 4.0)
   a. composition techniques
   b. different typestyles.
   c. variations in justification.
4.6 Analyze layout principles. (Gateway English II 3.0)
4.7 Analyze principles of design: (Gateway English II 3.0; Gateway Algebra I 5.0)
   a. special effects techniques
   b. thumbnail sketches
   c. guides, rulers, scales, menus, pallets
   d. text alignment, element positioning, rules of page design for printed text
   e. margins, gutters, tabs, letter spacing, tracking, leading and headings
   f. columnar grid setup
   g. style formulation
   h. master page construction
   i. spot color and process color to text and graphics

4.8 Illustrate gradations in shapes and blend colors. (Gateway Algebra I 5.0)
4.9 Illustrate methods of importing and exporting text and graphics. (Gateway English II 3.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Prepares a layout using typography specifications.
- Applies layout and design principles using original and/or imported graphics. *(Gateway Algebra 5.0)*
- Applies spot color to graphics and text.
- Applies typographical commands to text.
- Rotates text and graphics. *(Gateway Algebra 5.0)*
- Proofs, edits, resizes, crops/manipulates copy and graphics. *(Gateway Algebra 2.0)*
- Prints or publishes hard copy that meets publication and design standards.

Sample Performance Task

- Have students illustrate at least three font technologies. Using different backgrounds compare and contrast the typography of each.
- Assigned to teams, key and format a publication announcing a fundraising activity,

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 5.0

The student will accurately create a variety of word processing documents.

Learning Expectations

The student will:

5.1 Compare and contrast the uses of word processing and desktop publishing software. (Gateway English II 1.20, 2.0, 3.0, 4.0)

5.2 Apply accurate formatting skills to a variety of documents such as academic course work and business and industry materials. (Gateway English II 3.0)

5.3 Use appropriate capitalization, punctuation, number expression rules, and editing/proofreading skills to produce mailable documents. (Gateway English 1.0, 2.0, 3.0)

Student Performance Indicators: Evidence Standard Is Met

The student:

- Inputs and formats documents for a specific communication project.
- Demonstrates document productivity by using appropriate proofreading skills and editing skills.

Sample Performance Task

The student will compose and format a one-page report on the topic: *How Computers are used in a Career of Interest.*

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 6.0

The student will create and design spreadsheets to produce and format data.

Learning Expectations

The student will:

6.1 Recognize the advantages of spreadsheets.
6.2 Explain the functions and terminology of spreadsheet software. (Gateway English II 1.0, 2.0; Gateway Algebra I 1.0, 2.0)
6.3 Input, edit, and format cell contents. (Gateway English II 1.0, 2.0, 3.0, 4.0; Gateway Algebra I 1.0, 3.0)
6.4 Analyze formulas. (Gateway English II 3.0; Gateway Algebra I 2.0, 3.0)
6.5 Create graphs. (Gateway Algebra I 3.0, 5.0)

Student Performance Indicators: Evidence Standard Is Met

The student:

- Demonstrates the functions and terminology of spreadsheet software.
- Creates spreadsheets using appropriate inputting, editing, and formatting skills.
  - Develops and applies formulas.
  - Incorporates graphic elements.
  - Set up print specifications and print.

Sample Performance Task

Divide the class into groups of two and have them create a spreadsheet with given information concerning an organization fundraising activity.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 7.0

The student will develop database skills to organize and maintain information.

Learning Expectations

The student will:

7.1 Assess the advantages of database management as a method for organizing data.
7.2 Describe the functions of database software and identify related terminology. (Gateway English II 2.0, 3.0)
7.3 Plan and create a database. (Gateway English II 1.0, 3.0; Gateway Algebra I 2.0)
7.4 Input, sort, search, edit, and update data. (Gateway English II 3.0)
7.5 Create a database report. (Gateway English II 3.0; Gateway Algebra I 2.0)

Student Performance Indicators: Evidence Standard Is Met

The student:

- Constructs databases using appropriate inputting, formatting, and editing skills.
- Searches and sorts database for specific information.
- Creates and formats database reports.

Sample Performance Task

The student will design a database given specific contact demographic data for a fundraising activity.

Computer Technology Curriculum Standards
Section 3 Research and Development

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algerba I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 8.0

The student will design a multimedia presentation.

Learning Expectations

The student will:

8.1 Use software packages for multimedia and observe operating procedures. (Gateway English II 3.0)
8.2 Appraise the basic concepts of interactive multimedia design.
8.3 Critique multimedia presentations and discuss the strengths and weaknesses of the presentation. (Gateway English II 1.0, 3.0, 4.0)
8.4 Identify equipment and software requirements necessary to make a multimedia presentation. (Gateway English II 3.0)
8.5 Develop a storyboard. (Gateway Algebra I 5.0)
8.6 Design, create, and present a multimedia presentation within the framework of copyright laws. (Gateway English II 1.0, 2.0, 3.0; Gateway Algebra I 5.0)

Student Performance Indicators: Evidence Standard Is Met

The student:

- Create a ten-slide multimedia presentation applying inputting, formatting, and editing skills.
- Inserts and/or scans necessary graphics, digital clips, and/or video clips within the framework of copyright laws.
- Print an outline and a copy of the audience handout with given number of frames to a page.
- Deliver the presentation to a specific audience.

Student Sample Performance Task

The student will design an interactive multimedia presentation for recruitment of a co-curriculum student organization such as a computer science chapter, Business Professionals of America and/or Future Business Leaders of America. The presentation is designed for and presented to the 7th and 8th grade assembly.

Computer Technology Curriculum Standards
Section 3 Research and Development

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 9.0

The Student will examine new and emerging technologies.

Learning Expectations

The student will:

9.1 Forecast future trends using knowledge of current technology. (Gateway Algebra I 4.0)
9.2 Compare and contrast potential changes in technologies, lifestyles, and employment needs. (Gateway English II 1.0, 4.0)
9.3 Discuss emerging technology, such as handheld devises, voice and handwriting recognition. (Gateway English II 2.0, 3.0, 4.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches emerging trends in the field of computer technology, related applications, and potential employment opportunities.
- Predict and assess emerging trends in computers, communication, and business.

Sample Performance Task

Prepare a presentation that shows the on the emerging technologies.

Integration/Linkages

All subject areas, US and Tennessee Departments of Labor Statistics, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Standard 10.0

The student will examine network, hardware, software, and applications.

Learning Expectations

Computer Technology Curriculum Standards
Section 3 Research and Development

The student will:

10.1 Compare and contrast types of networks, considering definition, benefits, and types. (Gateway English II 1.0, 2.0, 3.0, 4.0)

10.2 Identify the basic components of a communication system: (Gateway English II 3.0)
- a. hardware
- b. compare programming languages
- c. software

10.3 Differentiate the Internet and an intranet. (Gateway English II 1.0, 2.0, 3.0, 4.0)

10.4 Explain how Internet services work. (Gateway English II 1.0, 2.0, 4.0)

10.5 Analyze network and Internet etiquette, security, privacy, and copyright issues. (Gateway English II 2.0, 3.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Appraises the basic components of communications systems.
- Diagrams a communications system incorporating various hardware devices.
- Distinguishes between the Internet, intranet, and the World Wide Web.
- Practices proper Internet etiquette, security, privacy, and copyright laws.
- Utilizes the Internet/intranet for electronic communication and research.
- Evaluates the validity of information received through the Internet.
- Complies with all security, privacy, and copyright laws and regulations.

Computer Technology Curriculum Standards
Section 3 Research and Development

Sample Performance Task

Divide the students into groups. Each group will research, prepare, and make a report on the different communicating systems. Each group will apply etiquette, security, privacy, and copyright laws and regulations. The report should include text, graphics, digital clips, database information and numerical data relating to the findings. Mailable standards will be applied to this project. Remind each group member of his or her responsibilities and roles as a group member.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals, Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 11.0

The student will develop and demonstrate human relations, self-management, organizational, and professional leadership skills.

Learning Expectations

The student will:

11.1 Examine the value of leadership skills and confidence through personal reflection.
11.2 Assess image building and public relations techniques.
11.3 Assess decision-making skills.
11.4 Demonstrate effective teamwork. (Gateway English II 4.0)
11.5 Apply parliamentary procedure skills in group activities.
11.6 Demonstrate effective teamwork and group thinking applying problem solving, decision making, and conflict resolution techniques. (Gateway English II 4.0)
11.7 Examine the goals and apply the principles of a co-curricular student organization. (Gateway English II 4.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches, analyzes, composes, keys, formats, and prints a report on the attributes of a leader.
- Applies effective image-building and public relations techniques.
- Designs, writes formulas, keys and formats financial data for the local chapter in a spreadsheet.
- Organizes and manages a team presentation on leadership.
- Demonstrates parliamentary procedure skills through group activities.
- Participates in a mock Business Professionals of America, Computer Science Club, and/or Future Business Leaders of America, meeting.

- Makes a two-minute oral report on attributes of a leader.
- Participates in a mock Computer Science, Business Professionals of America and/or Future Business Leaders of America organization meeting.

Sample Performance Task

Divide the students into groups. Each group will work on a different segment of the Computer Science, Business Professionals of America and/or Future Business Leaders of America organization annual report. Assign each group one of the four major applications to complete this project. The report should include text, graphics, digital clip(s), database information, and numerical data relating to the chapter's activities. Mailable standards will be applied to this project. Remind each group member of his or her responsibilities and role as a group member.

Integration/Linkages

All subject areas, *SCANS (The Secretary's Commission on Achieving Necessary Skills)*, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Standards for Business Education, Business Professionals of America *Work Place Skills*, Future Business Leaders of America National Competencies, Delta Pi Epsilon, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards, Data Processing Management Association, International Association of Administrative Professionals Gateway Algebra I, and Gateway English II.

COMPUTER TECHNOLOGY: Research and Development

Grades 9-12

Adventures in Computing

This course is written for one unit of credit.

Course Description: This course is designed to give students in-depth research and structured programming language skills by using the computer as a tool to assist in the research and the interpretation of data gathered. At the end of the course the student teams will present their findings.

Standards

1. The student will investigate the use of computers as a tool.
2. The student working as a team member will develop strategies for solving a real-world problem.
3. The student working as a team member, in collaboration with mentors, will develop a structured computer program.
4. The student working as a team member, in collaboration with mentors, will develop a presentation for the real-world problem solution.

Standard

1. The student will investigate the use of computers as a tool.

   Learning Expectations
   The student will
   1. Identify the importance of computers in solving real-world situations.
   2. Identify the procedures and applications used in solving these situations.
   3. Use the Internet to investigate problems solved by using computers.

Performance Indicators: Evidence Standard is Met

The student is able to

- use the computer as a tool in solving real-world problems.

Sample Performance Task

Computer Technology Curriculum Standards
Section 3 Research and Development

The student will review and analyze the solution of a real-world problem by using a prepared program.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

2. The student working as a team member will develop strategies for solving a real-world problem.

   Learning Expectations
   The student will
   1. Define team roles.
   2. Research and select a problem topic.
   3. Seek mentors.
   4. Collaborate with mentors to define an hypothesis, mathematical model and method of solution for the problem.

Performance Indicators: Evidence Standardls Met

The team is able to

- describe the real-world problem to be solved.
- develop a portfolio to chronical project development.

Sample Performance Task

Write a letter requesting mentorship. The letter should include the problem to be solved, the role of the mentor and student team and a timeline for the project development.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills

Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

3. The student working as a team member, in collaboration with mentors, will develop a structured computer program.

   Learning Expectations
   The student will
   1. Determine which data types would be appropriate for solving the problem.
   2. Write code for the mathematical model using assignment statements, arithmetic operators, intrinsic functions and logical expressions.
   3. Demonstrate the use of looping structures and/or control statements to implement the program.
   4. Read and/or write data files for input to the program and for output of the results.
   5. Implement arrays, functions and subroutines for the program.
   6. Graph the data using software applications.

Performance Indicators: Evidence Standard Is Met

The team is able to

- design and write in a structured computer language using mathematical modeling appropriate to the problem.
- analyze the conclusions from the visualization of the data.

Sample Performance Task

Each team will develop a mini project demonstrating the fractal for Pascal's triangle.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Standard

4. The student working as a team member, in collaboration with mentors, will develop a presentation for the real-world problem solution.

   Learning Expectations
   The student will
   1. Explain the parts of the technical paper.
   2. Organize and design a visual display.
   3. Practice and critique presentation skills.

Performance Indicators: Evidence Standard Is Met

The team is able to:

- write a technical paper describing the work on the problem.
- create and exhibit a display communicating project results.
- present the solution of the real-world problem.

Sample Performance Task

Students will look at presentations, documents and exhibits, of other projects and critique them.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, Work Keys, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association, and Professional Secretaries International

Interactive Multimedia Presentation

The student will be proficient in using interactive multimedia tools to develop electronic presentations. Creative design, persuasive communications, and language arts skills are applied through research, evaluation, validation, written and oral communication. Typography, layout, and design guidelines are applied. Copyright laws and ethical practices are reinforced in creating and formatting various presentations that require imported data/graphics, digital, audio, and video clips. Team development will also be stressed as students work on multimedia project(s). Laboratory facilities and experiences simulate those found in business and industry.

Prerequisites: Keyboarding Applications

Recommended Prerequisites: Document Creation Design, Career Connection

Grades: 11, 12

Recommended Credit: ½*- 1 Credit

Note: Learning expectations to be completed for one-half credit have no asterisk. Additional learning expectations to be completed for one credit are identified with an asterisk(*).

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 1.0

The student will demonstrate a comprehension of the materials, technologies, media, components and their working relationship utilized within the industry.

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry.

Standard 3.0

The student will research and apply typography, layout, design, and composition concepts and guidelines for preparation of a multimedia project.

Standard 4.0

The student will organize information and communicate ideas by visualizing space configurations and movements.

Standard 5.0

The student will relate and apply artistic knowledge, skills, and techniques to the production of various projects.

Standard 6.0

The student will communicate ideas and information to a variety of audiences for a variety of purposes.

Standard: 7.0

The student will evaluate the purposes, functions, and features used in preparing digital communication.

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 8.0

The student will apply concepts and use technology tools and resources to create content, manage information, and communicate ideas relevant to a specific project.

Standard 9.0

The student will develop and demonstrate human relations, self-management, organizational and professional leadership skills.

Standard 10.0

The student will collaborate with peers, experts and others to develop a finished interactive multimedia project.

Standard 11.0

The students will evaluate career opportunities and career paths while demonstrating employability skills required within the industry.

Computer Technology Curriculum Standards
Section 3 Research and Development

Course Description

The student will be proficient in using interactive multimedia tools to develop digital communication presentations. Creative design, persuasive communications, and language arts skills are applied through research, evaluation, validation, written and oral communication. Typography, layout, and design guidelines are applied. Copyright laws and ethical practices are reinforced in creating and formatting various presentations that require imported data/graphics, digital, audio, and video clips. Team development will also be stressed as students work on multimedia project(s). Laboratory facilities and experiences simulate those found in business and industry. *(This course requires a computerized workstation for each student with presentation management software and tools provided.)*

Standard 1.0

The student will demonstrate a comprehension of the terminology materials, technologies, media, components and their working relationship utilized within the industry.

Learning Expectations

The student will

1.1 Define interactive multimedia presentation terminology. (Gateway English II 1.0, 2.0, 3.0, 4.0)

1.2 Examine portfolio components, usage, and evaluation. (Gateway English II 2.0, 3.0)

1.3 Describe the basic components of an interactive multimedia presentation and their working relationships. (Gateway English II 1.0, 4.0)

1.4 Analyze audio and video media. (Gateway English II 1.0, 3.0)

1.5 Describe examples of digital media such as:
   a. graphics
   b. digital photography
   c. video
   d. sound
   e. music
   f. animation
   g. motion

1.6 Recognize the various types of formats that can be found in a project.
1.7 Describe basic principles of user-interface.
1.8 Define intellectual property and fair use.
1.9 Explain general concepts of user interaction.

Student Performance Indicators: Evidence Standard Is Met

The student:

- Starts a portfolio that includes examples of each of the components and resources used in developing an interactive multimedia presentation.
- Reports current trends and issues relating to intellectual property and fair use.

Sample Performance Task

The student will collect and identify the various types of digital media. Each example should provide the file size, file type and source of the media. Assessment will be done through the portfolio.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), and International Association of Administrative Professionals (IAAP), Gateway English II

Standard 2.0

The student will research and apply knowledge of ethical and legal issues within the industry

Learning Expectations

The student will:

Computer Technology Curriculum Standards
Section 3 Research and Development

2.1 Demonstrate work ethics that include integrity, honesty, loyalty, and perseverance that meet industry standards.
2.2 Research benefits and consequences resulting from the practice of business ethics. (Gateway English II 2.0, 3.0)
2.3 Comprehend copyright laws and their applications to text, visual art, design, music, and photography. (Gateway English II 2.0, 3.0)
2.4 Research legal responsibilities associated with the use of the Internet as required by federal and state government agencies. (Gateway English II 2.0, 3.0)
2.5 Evaluate source material for its authenticity, validity, and perspective.
2.6 Evaluate safety issues associated with the use of the Internet.

Student Performance Indicators: Evidence Standard is Met

The student:

- Applies ethical conduct providing the proper credit to those whose ideas and content has been used in creating interactive multimedia projects.
- Demonstrates ethical behaviors in what is written, spoken, or presented in designing and presenting a multimedia project.
- Applies knowledge of copyrights in seeking formal permission from copyright sources before using materials.
- Recognizes the legal implications of violating federal and state laws in multimedia\digital publishing.
- Demonstrates legal responsibilities using the Internet for interactive multimedia projects.
- Selects source material that is reliable and credible in development of the presentation.
- Demonstrates skills necessary for safety and environmental protection in digital design and photography
- Develops a virtual presentation on ethical, legal, and safety issues that could be posted on the web.

Sample Performance Task

Design and produce an interactive multimedia project on legal and ethical issues that includes issues and penalties for plagiarism; copied data without permission but with attribution, according to fair use guidelines; copied data with permission; and the process used to obtain permission. Obtain formal permission for use of text, art form, design, music, and photographs. Develop and present a total team interactive multimedia project utilizing various technology components.

Integration/Linkages

Computer Technology Curriculum Standards
Section 3 Research and Development

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 3.0

The student will research and apply typography, layout, design, and composition concepts and guidelines for preparation of a multimedia project.

Learning Expectations

The student will:

3.1 Analyze composition processes. (Gateway English II 1.0, 2.0, 3.0, 4.0)
3.2 Analyze principles of typography. (Gateway English II 1.0, 2.0, 3.0)
3.3 Illustrate how to apply typographical commands to text.
3.4 Evaluate the effectiveness of typography in publications. (Gateway English II 1.0, 2.0, 4.0)
3.5 Compare and contrast the typography from at least two print sources (Gateway English II 1.0, 2.0, 3.0, 4.0)
- a. composition techniques.
- b. different typestyles.
- c. different types of justification.

3.6 Analyze layout principles. (Gateway English II 3.0)
3.7 Analyze principles of design: (Gateway English II 3.0; Gateway Algebra I 5.0)
- a. special affects techniques
- b. thumbnail sketches
- c. guides, rulers, scales, menus, pallets
- d. text alignment, elements positioning, rules of page design for printed text
- e. margins, gutters, tabs, letter spacing, tracking, leading and headings
- f. columnar grid setup
- g. style formulation
- h. master page construction
- i. spot color and process color to text and graphics

3.8 Illustrate gradiations in shapes and blend colors. (Gateway Algebra I 5.0)
3.9 Illustrate methods of importing and exporting text and graphics. (Gateway English II 3.0)

Computer Technology Curriculum Standards
Section 3 Research and Development

Student Performance Indicators: Evidence Standard is Met

The student:

- Prepares a layout using typography specifications.
- Applies layout and design principles using original and/or imported graphics. *(Gateway Algebra 5.0)*
- Applies spot color to graphics and text.
- Applies typographical commands to text.
- Rotates text and graphics. *(Gateway Algebra 5.0)*
- Proofs, edits, resizes, crops/manipulates copy and graphics *(Gateway Algebra 2.0)*
- Prints or publishes hard copy that meets publication and design standards.

Sample Performance Task

- **Have students illustrate at least three font technologies. Using different backgrounds, contrast and compare the typography of each.**
- Design and create various projects, i.e., commercial, ad campaign, public relations announcement, master slide for a legislative presentation….

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 4.0

The student will organize information and communicate ideas by visualizing space.

Learning Expectations:

The student will:

4.1 Demonstrate design and layout techniques. (Gateway Algebra I 5.0)
4.2 Create simple illustrations (Gateway English II 1.0, 3.0; Gateway Algebra I 5.0)
4.3 Demonstrate development of layouts applying elements of line, shape, texture, and value to create form and space. (Gateway Algebra I 3.0, 5.0)
4.4 Organize information and communicate ideas by visualizing space configuration scale. (Gateway English II 1.0, 4.0; Gateway Algebra I 3.0, 5.0)
4.5 Demonstrate the ability to use computer software to identify, create, and manipulate surfaces, scale, rotation, zoom, shading and layout.
4.6 Identify element styles of animation, art, sketching and drawing. (Gateway Algebra I 5.0)
4.7 Demonstrate ability to operate camera, import digital media, and manipulate the media.

Student Performance Indicators: Evidence Standard is Met

The student:

- Applies basic design techniques to illustrate print and digital applications for layout and scale. (*Gateway Algebra 1.0, 2.0, 3.0)*
- Develop 3D shapes and textures.
- Apply elements styles of animation, art, sketching and drawing in an interactive multimedia presentation.
- Create, edit, copy and manipulate dimensional layout/spreads, geometric entities, and drawings using drawing tools industry standards. *(Gateway Algebra 1.0, 2.0, 5.0)*
- Illustrate line, design and artistic details in layouts. (Gateway Algebra 3.0, 5.0)
- Demonstrates how to use imaging technology to create a unique and product. *(Gateway Algebra 5.0)*
- Applies proper photographic skills. *(Gateway Algebra 1.0, 2.0, 5.0)*
- Creates a layout that successfully applies elements of line, shape, texture, and value to create form and space.

Sample Performance Tasks

Assign a teamwork activity to develop and demonstrate digital imaging preparation, reproduction, and finishing an interactive multimedia product that includes computer-generated sketches, screen captures, cropping and scaling photographs, and electronically developed line art in layouts.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Standard 5.0The student will relate and apply artistic knowledge, skills, and techniques to the production of various projects.

Learning Expectations

The student will:

5.1 Compare and contrast a variety of different media resources. (Gateway English II 1.0, 2.0, 3.0, 4.0)
5.2 Review and evaluate appropriateness of presentations with reference to audience. (Gateway English II 4.0)
5.3 Evaluate professional look of templates of master slides. (Gateway English II 3.0; Gateway Algebra I 5.0)
5.4 Discuss continuity and form in presentation. (Gateway English II 1.0, 4.0)
5.5 Identify the various techniques utilized in software applications, such as photo editing, music sampling, graphic animation. (Gateway English II 3.0; Gateway Algebra I 3.0, 5.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Differentiates and reports on styles, color, graphics, and formatting used in various newsprint media. *(Gateway Algebra I 3.0, 5.0)*
- Creates or selects a master slide based on the media used and customer's project that is to be developed.
- Designs style-sheets which emphasize continuity and form in presentation. (Gateway Algebra I 2.0, 5.0)
- Employs image manipulation using digital tools. (Gateway Algebra I 1.0, 3.0. 5.0)
- Digitally manipulates, enhances, and produces photographs or other art elements utilizing photo editing software.

Computer Technology Curriculum Standards
Section 3 Research and Development

Sample Performance Task

- **Access the Internet and find related noncopyrighted clip art for a master slide.**
- **Create a design and layout for a specific product which could be used in industry. Work in conjunction with team members to produce multiple slides. Maintain a portfolio.**

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 6.0

Students communicate ideas and information using a multimedia presentation to a variety of audiences for a variety of purposes.

The student will:

6.1 Demonstrate the ability to communicate information to a specific audience for a specific purpose in print, art, and/or speech. **(Gateway English II 1.0, 3.0, 4.0)**

6.2 Explore persuasive communication skills using various media. (Gateway English II 3.0, 4.0)

6.3 Identify media techniques and processes used to achieve identified goal. (Gateway English II 1.0, 2.0, 3.0)

6.4 Compare and contrast the power of digital communication versus a traditional communication presentation. (Gateway English II 1.0, 2.0, 3.0, 4.0)

6.5 Analyze style layouts to determine how they reflect, influence, and communicate ideas. (Gateway English II 3.0; Gateway Algebra I 5.0)

6.6 Use persuasive forms of communication and write for a variety of audiences. (Gateway English II 1.0)

Student Performance Indicators: Evidence standard is met

The student:

- Determines appropriate preparation for a multimedia oral presentation to a specified audience. (Gateway English II 3.02, 3.06)
- Applies media techniques and processes with sufficient skill to achieve identified goal.
- Identifies a topic to be used in developing an interactive multimedia presentation to be presented to a given audiences on a specific topic.
- Creates a style layout to be used in presenting the given topic
- Lays out a storyboard, incorporating script, visuals, format and sequence for presentation. (Gateway English II 1.08, 1.09)
- Designs an interactive multimedia presentation using storyboard sequence multimedia software
- Prints audience handouts and a speaker outline.
- Presents an oral presentation directed to specific audience. (Gateway English II 4.03) Maintains a portfolio.
- Prepares and delivers a persuasive interactive multimedia presentation. Maintains a portfolio.
-

Sample Performance Task

- Students select a specific audience and related topic and research information to present a multimedia presentation with accompanying oral commentary to fit a specific audience. Presentation handouts and outline of commentary will be given to audience. Students will work in peer groups on storyboard layout, design presentation, practicing, editing the presentations, and making the final presentation. Students will evaluate presentations using a rubric to evaluate planning, revisions, and presentations. *(Gateway English II 3.01, 3.02, 3.03)*
- Create a layout and design that successfully conveys a central thought based on information, ideas, composition that would appeal to the desired audience,. Research media and digital print to prepare a persuasive communication presentation or report which identifies the audiences, describes ideas and emotions portrayed by the author, and communicates messages through the use of text, graphics, animated clip art and music clip. *(Gateway English II 3.01, 3.02, 3.03)*

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), and International Association of Administrative Professionals (IAAP), Gateway Algebra I and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard: 7.0

The student will evaluate the purposes, functions, and features used in preparing digital communication.

Learning Expectations

The student will:

7.1 Compare and contrast the differences in presentation text, imaging, audio, video, and graphic software. (Gateway English II 1.0, 2.0, 3.0, 4.0; Gateway Algebra I 3.0, 5.0)
7.2 Interpret/use terminology, features and concepts of digital communication. (Gateway English II 2.0)
7.3 Identify layout and design criteria used in producing a professional looking interactive multimedia presentations. (Gateway English II 3.0; Gateway Algebra I 3.0, 5.0)
7.4 Identify various items that can be designed and published using presentation digital communications software. (Gateway English II 3.0)
7.5 Compose, organize and edit information using keyboard, scanner, Internet, media player, and a digital camera. (Gateway English II 1.0, 3.0; Gateway Algebra I 5.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Creates a storyboard that illustrates the software applications used and the function of each in developing interactive multimedia projects as one of the portfolio activities.
- Applies interactive multimedia terminology, concepts, and features.
- Applies layout and design criteria to produce professional looking interactive multimedia presentations.
- Modifies a pre-designed presentation to demonstrate creativity.
- Extracts and places text, graphics, audio and/or video clips in a presentation project.

Sample Performance Task

Divide the class into groups. Formulate sentences related to digital communications and key them into a one-page document. Import the list to a presentation management program and use the tools palette to complete the layout and design.

Computer Technology Curriculum Standards
Section 3 Research and Development

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 8.0

The student will apply concepts and use technology tools and resources to create content, manage information, and communicate ideas relevant to a specific project.

Learning Expectations

The student will:

8.0 Determine appropriate preparation for an oral and/or written presentation to a specified audience. (Gateway English II 2.0, 4.0)

8.1 Select the appropriate tools to develop an interactive multimedia project. (Gateway English II 3.0)

8.2 Develop the interactive multimedia project. (Gateway English II 1.0, 2.0, 3.0, 4.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Produces and presents a finished product using various interactive multimedia tools.
  - Utilizes graphic design software to create original digital art.
  - Uses sound editing software to create original music/sound
  - Incorporates animate text or graphics using application software.
  - Designs logic structures to handle user interaction.
- Prepares script, visuals, and format with animated text and graphic sound clips for presentation.
- Presents an oral presentation directed to specific audience. with interactive multimedia software.

Sample Performance Tasks

- Upon completion of unit of study, students select a related topic and gather information to present a multimedia presentation with accompanying oral commentary to fit a specific audience (civic organizations, student organization, parent meeting, etc.) Presentation handouts and outline of commentary will be given to audience. Students will work in teams to practice and edit presentations before final presentation. Students will evaluate presentations using a rubric. Teachers will evaluate planning, revisions, and presentations.

- Design an electronic interactive portfolio that showcases examples of both creative work (music, art, etc.) as well as examples of work created in other areas of study (English essays, social studies research, etc.).

Integration/Linkages

SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), English I, Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 9.0

The student will develop and demonstrate human relations, self-management, organizational and professional leadership skills.

Learning Expectations

The student will:

9.1 Examine the value of leadership skills and confidence through personal reflection.
9.2 Assess image building and decision making skills. (Gateway English II 1.0)
9.3 Illustrate public relations techniques. (Gateway English II 1.0)
9.4 Demonstrate effective teamwork.
9.5 Apply parliamentary procedure skills. (Gateway English II 4.0)
9.6 Examine the goals and principles of organizations such as Business Professionals of America, Computer Science Club, Future Business Leaders of America, etc. (Gateway English II 2.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Analyzes leadership and confidence through professional development activities.
- Applies effective image building technique.
- Composes and lays out informative articles for publication in local and/or state publications.
- Organizes and manages a team presentation on leadership.
- Demonstrates parliamentary procedure.
- Participates in Business Professionals of America, Computer Science Club, Future Business Leaders of America, etc.

Sample Performance Task

Creates, lays out and presents a presentation about local chapter activities in the school assembly.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I and Gateway English II , Youth organization handbook

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 10.0

The student will collaborate with peers, experts, and others to develop a finished interactive project.

Learning Expectations

The student will

10.0 Define team roles. (Gateway English II 1.0)
10.2 Define team norms. (Gateway English II 1.0)
10.3 Identify the components of an interactive multimedia project. (Gateway English II 1.0, 2.0, 3.0)
10.4 Select a project topic.
10.5 Design a map or storyboard for the topic/project. (Gateway Algebra I 5.0)
10.6 Create or acquire the necessary graphics, digital photography or video.
10.7 Develop or acquire sound and/or music. (Gateway English II 3.0; Gateway Algebra I 3.0, 5.0)
10.8 Create an animation. (Gateway English II 3.0; Gateway Algebra I 3.0, 5.0)
10.9 Locate or create content.
10.10 Create a user-interface model for interaction.
10.11 Develop a project.
10.12 Present the finished product to an audience. (Gateway English II 4.0)
10.13 Test the finished product and evaluate the team process.

Student Performance Indicators: Evidence Standard Is Met

The student

- Collaborates with others to produce a finished multimedia project.
- Packages the final project for dissemination

Sample Performance Task

- Create a kiosk presentation for a school. The finished product should include all aspects of the school environment (teachers, students, classes, sports, extra-curricular, etc.). Team building should include the creation of areas of specialty (graphics, sound, content, etc.) and a management structure. Specific timelines should be created, posted, and monitored.

- Create a product that will introduce the planets in our solar system to a sixth grade audience. The finished product should include a review and test module and the necessary art for marketing the product. Evaluation will be determined by the successful presentation and utilization of the product.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, and Gateway English II

Computer Technology Curriculum Standards
Section 3 Research and Development

Standard 11.0

Students will evaluate career opportunities and career paths while demonstrating employability skills required within the industry.

Learning Expectations

The student will:

11.1 Research the Multimedia Design\Digital Communications industry for various career paths and job titles. (Gateway English II 2.0, 3.0)
11.2 Develop an inventory of interest and map interest with the duties your profile of career opportunities in the Multimedia Design\Digital Communications field.
11.3 Project future career opportunities within the industry. (Gateway Algebra I 3.0, 4.0)
11.4 Research and analyze organizational skills necessary to achieve success in school or in the work place. (Gateway English II 2.0)
11.5 Discuss the importance of maintaining a work schedule, meeting deadlines, maintaining a clean and orderly work area, working on multiple tasks simultaneously, maintaining inventory, and storing materials in appropriate locations. (Gateway English II 4.0)

Student Performance Indicators: Evidence Standard is Met

The student:

- Researches and develops a profile of career opportunities in the Multimedia Design\Digital Communications field.
- Designs an inventory check sheet of personal interest and employers. expectations in Multimedia Design\Digital Communications field.
- Profiles personal characteristics, which are beneficial to the success of a professional in industry.
- Researches and develops a projection of industry trends related to career opportunities in field.
- Demonstrates skills that tend to lead to promotions, such as continuing education, attendance, attitude, professionalism, compliance with policies and procedures, priority on customer service *(internal and external)*, adaptability to organizational change, and development and use of communication skills.

Sample Performance Task

Develop a presentation to teach time management skills and techniques. Present the presentation to classes in the school, community organization, and professional groups. Develop an interactive multimedia design presentation for

the Multimedia Design\Digital Communications career field. Participate in a mock performance review.

Integration/Linkages

All subject areas, SCANS, National Standards for Business Education, Policy Commission for Business and Economic Education, National Science Education Standards, National Math Standards, National Language Arts Skills Standards, National Educational Technology Standards (NETS), Data Processing Management Association (DPMA), International Association of Administrative Professionals (IAAP), Gateway Algebra I, Gateway English II , *Dictionary of Occupational Titles, SOURCE, Tennessee Edition of the American Careers Program*